

Highlights

2024

SAFETY- CLASSIFIED LIFTING DEVICE

for handling
nuclear fuel

LONG LIFE FOR THE DEVICES

with the Service &
Retrofit service

enmac

NEW LOADING ARMS

enhance the safe handling
of fuels in Oulu

HEAVY DUTY ROOF SCRABER

prevents dangerous
situations in traffic

enmac



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WELCOME TO READ HIGHLIGHTS 2024

New openings in the midst of global and domestic crises

In 2023, we have experienced the effects of an economic recession, with increased interest rates causing uncertainty in the market. At the same time, ongoing serious geopolitical crises overshadow global growth. At the time of writing this, the ongoing labor market crisis in Finland threatens the national economy's already slow growth. It can be said that we have lived in various crises for four years already.

Despite the crises, or perhaps partly because of them, companies have to evaluate their own operations and competitiveness in the current operating environment - this is what we too have done at Enmac.

In 2023, we continued our strong growth both organically and through acquisitions, when PJT Engineering Oy from Raahe joined our group in the spring. During the past year, we continued to strengthen our chosen strategy related to system deliveries - their share of our turnover reached the level of 30 percent.

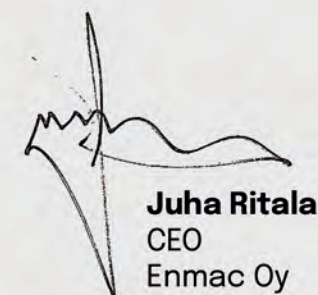
New openings were made with our important customers, e.g. in projects related to product development, in the success of which Enmac had a significant contribution right from the definition phase. In addition, we decided to launch new businesses in the Service & Retrofit and IIOT areas. We established new offices in Raahe, Vaasa and Kemi and started the launch of our own products with equipment that can be used to clean snow and ice from the roof of heavy vehicles.

Ratkaiseva insinööritoimisto - Problem solving company.

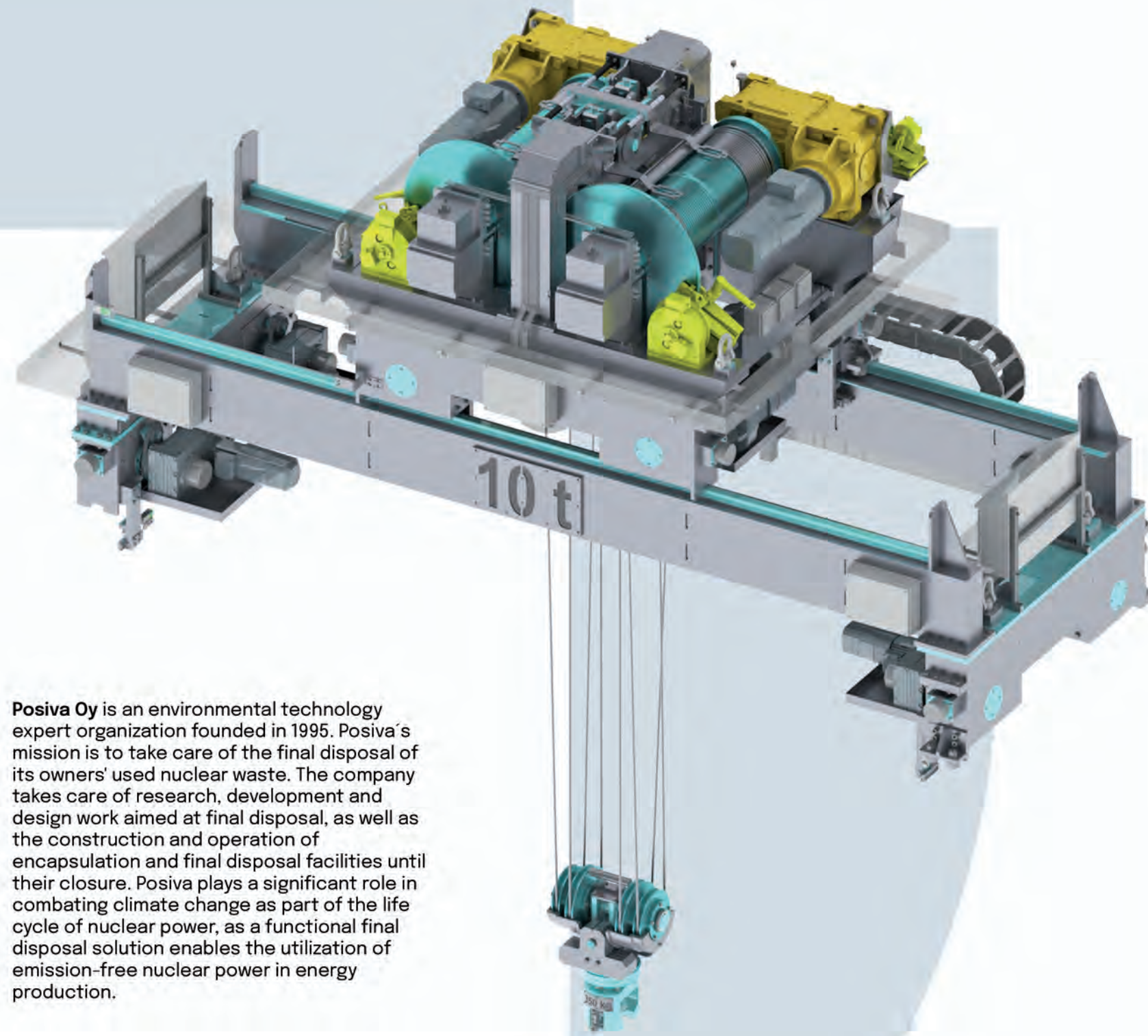
We used these phrases when renewing our brand. They reflect well Enmac's way of working: challenges are looked for and solutions are found in such a way that one can be genuinely proud of the result of the work. In this context, I would like to thank our customers for offering challenges and our own personnel for solving them.

I believe that during 2024 we will see a positive turn in the general economic situation and we will continue our growth in cooperation with our customers. We have compiled a few examples of the results of our great collaboration in this publication.

Enjoyable reading moments with our renewed Highlights!



Juha Ritala
CEO
Enmac Oy



Posiva Oy is an environmental technology expert organization founded in 1995. Posiva's mission is to take care of the final disposal of its owners' used nuclear waste. The company takes care of research, development and design work aimed at final disposal, as well as the construction and operation of encapsulation and final disposal facilities until their closure. Posiva plays a significant role in combating climate change as part of the life cycle of nuclear power, as a functional final disposal solution enables the utilization of emission-free nuclear power in energy production.

SAFETY-CLASSIFIED LIFTING DEVICE

for the demanding conditions of the nuclear fuel handling cell

Enmac and Posiva have developed together a concept of a nuclear fuel handling cell, in which the radiation protection lid of the fuel transport cask is handled with safety-classified lifting and transfer equipment. The device must handle the protection lid in a safe and controlled manner. Not even the possible failure of the device should jeopardize nuclear safety.

The fuel handling cell is in a relatively tight space and contains several intersecting systems, so the number of individual devices is limited. For this reason, the designed device must also handle covers and parts of other systems in addition to the lid of the transport cask.

The project had to take into account the conditions and requirements of the fuel handling cell that deviate from the normal machine design: the fuel handling cell is not accessible at all during the operation due to high radiation and otherwise only with special arrangements to avoid the risk of contamination. Consequently, the usability and reliability of the device had to be ensured despite the high degree of automation.

Enmac designed a single fault-tolerant, remote-operated crane equipped with duplicated mechanisms that moves on rails, which meets the requirements set by both the machinery directive and the authority that supervises radiation and nuclear safety. The lifting device uses a common crane track with the fuel handling machine and participates in the operational activities of several different systems.

This solution both improved the cost efficiency

of the fuel handling cell and achieved more procurement and manufacturing phases to seamless cooperation between the systems of different equipment suppliers. Enmac was involved in the role of the device's designer from the concept stage to the implementation planning.

"Even before this project, Enmac's experts had already worked in various equipment projects of Posiva's final disposal project, so there was concrete proof of their know-how," says **Petteri Vuorio**, Posiva's technical manager.

The transport cask lid lifter project made extensive use of Enmac's comprehensive mechanical design know-how, strength calculations and versatile expertise in various fields, for example the nuclear industry, hauling and lifting operations, and machine safety. In the planning phase of the project, in addition to detailed plans and technical calculations, the focus was on the safety culture characteristic of the core industry and high-quality documentation.

"With the selected model, a cost-effective implementation method was achieved for the device. The know-how gained for domestic designers and machine shops during the project cannot be underestimated either. This know-how will also be useful in the future. Safety-classified lifting and transfer equipment has not been implemented much domestically in recent years," Vuorio continues.

Enmac's project manager Katri Laine says that the precise official regulations brought an additional challenge to the project: "It was challenging and interesting to find out and fulfill the detailed regulations of the Radiation Protection Agency for a safety class 3 lifting device. We were involved in

Long cooperation as a resource

the device specifications throughout the planning, ensure that the end result meets the requirements. This required different and more extensive documentation regarding the design of functions and structures as well as component selection. It was interesting to see how the quality assurance and inspection processes progressed together with the authorities," says Laine.

Enmac prepared the required design material for the authority and supported Posiva, i.e. the responsible license holder, in qualifying the lifting device. During the manufacture, installation and assembly of the device, Enmac's design team was available even at short notice.

Enmac's chief designer **Ville Lahtinen** characterizes the project as challenging, but rewarding:

"In the lifting device project, the design team was able to make use of their expertise in a wide range of areas in the initial conceptualization, detailed component calculation and mechanical design of the crane structures. Due to the requirements of the nuclear industry, the project as a whole was extremely challenging, but also very rewarding. Especially during the testing phase of the device, it was great to be able to see the device fulfill the functionality requirements set for it," says Lahtinen.

Petteri Vuorio describes the cooperation with Enmac as being close and smooth: "The working model of the cooperation in this project was a bit different from previous projects, but despite this, it was quickly put to work when the project started. It is typical for nuclear plant projects that meeting the authority's requirements sometimes requires supplementing the design material and a broader justification of the chosen design solutions. Also these additional

needs were handled smoothly during the project," Vuorio continues.

Mika Lehtonen, Enmac's director of Pirkanmaa, tells about mechanical engineering services;

"We design and implement customer-oriented and high-quality solutions in areas such as machine, production system, vehicle and steel structure design. In addition, we carry out structural and flow analyses, strength calculations, simulations and structural optimizations related to mechanical design. We also design and implement on a turnkey basis a machine or device that fits the need, where efficiency, technology and the technology used meet the needs. We also help customers with new innovations, from feasibility studies, pre-planning and conceptualization all the way to product implementation."

Documentation is always part of our service. We produce all the documents required for the CE marking of machines and equipment: spare parts, operation and maintenance manuals, risk analyzes and manufacturing and assembly instructions. If necessary, we also take overall responsibility for the development and maintaining of documentation.

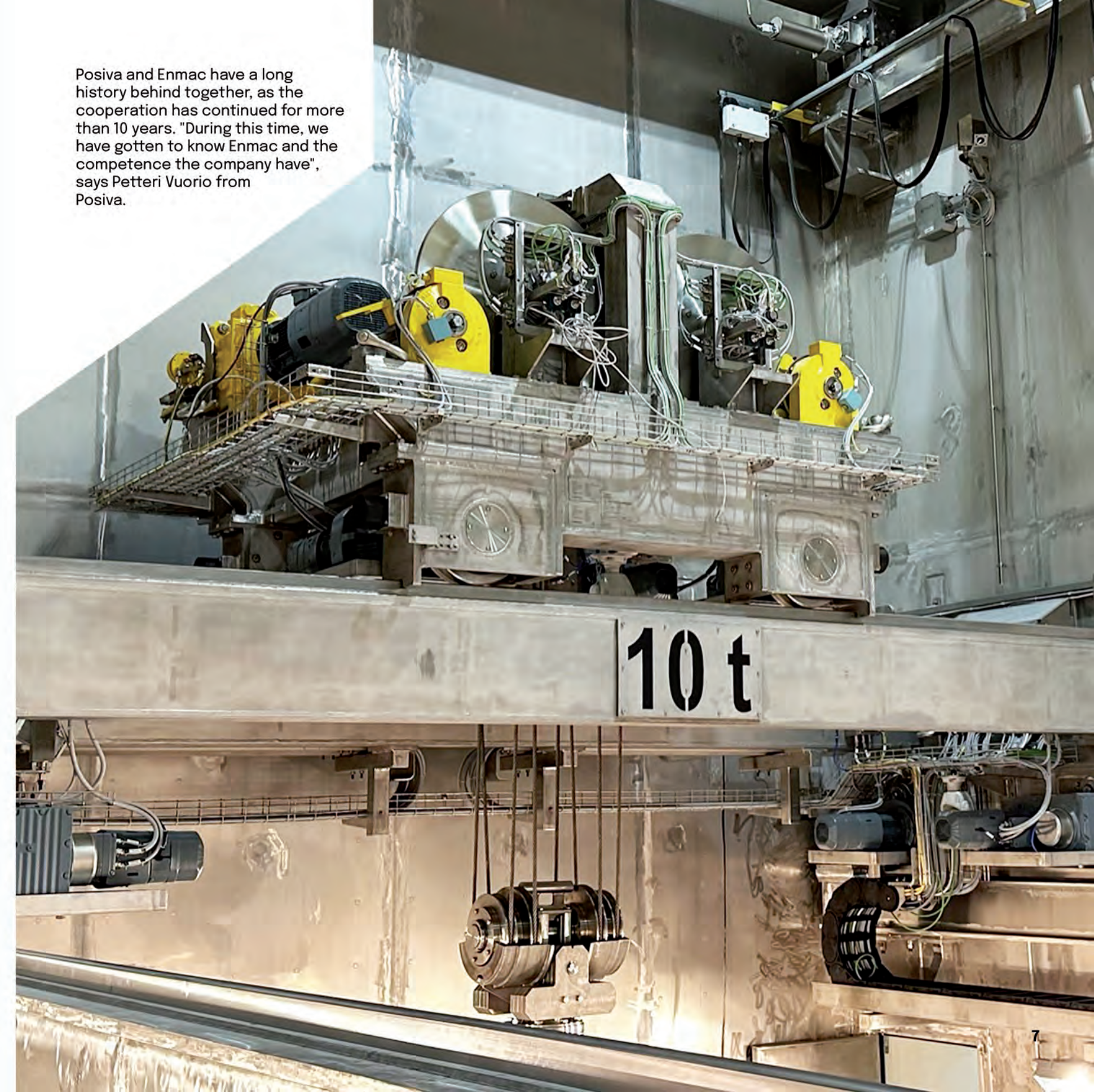
We choose the software used according to the work and the need. Our designers have efficient and appropriate tools at their disposal. If necessary, we can also use the customer's software and systems. We assemble a team of Enmac professionals in such a way that it serves the customer in the best possible way. Please don't hesitate to contact us if you have questions about our services!"

More about mechanical engineering:

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Posiva and Enmac have a long history behind together, as the cooperation has continued for more than 10 years. "During this time, we have gotten to know Enmac and the competence the company have", says Petteri Vuorio from Posiva.





UPM Communication Papers Oy's Rauma paper mill is located on the west coast near the city center of Rauma, in the immediate vicinity of the harbor. The factory produces lightly coated magazine papers (LWC). The factory was founded in 1969 and its production includes paper machines, as well as machines intended for the further processing of paper obtained from paper machines, such as slitters and super calenders.

"From the customer's point of view, the renewal of the control systems went without any problems in terms of planning, device deliveries, installations and commissioning. Based on the project, Enmac left an impression as a reliable and professional partner", says **Sami Häkli**, who was responsible for the project from UPM Communication Papers.

RENEWED CONTROL SYSTEMS RAPIDLY

The reliability and efficiency of the devices improved significantly

The machines at **UPM Communication Papers Oy's** Rauma paper mill are still mechanically in good condition, but the availability of spare parts for electrical and automation components is already starting to pose challenges. For this reason, UPM renews the electrical and automation control systems of its production equipment from time to time. Rauma paper factory chose Enmac as its partner for this automation control system renewal project.

At Enmac, we have done several similar types of control system renewals with a tight schedule, which means that we have solid experience in just such projects. We have a long history and experience in the paper industry, both in the design of the mechanical side and in the renewal of electrical and automation control systems. A wealth of experience has also strengthened our expertise in project management.

In the UPM Communication Papers paper mill project, the automation control system was renewed for paper machine 1's super calenders SC11 and SC12. Super calenders, on the other hand, are machines that polish the paper coming from the paper machine. Usually in similar projects there is only one supercalender to be renewed, but this time it was decided to renew both super calenders. Enmac's design director **Timo Setälä** tells about the challenging project, the schedule of which was determined only by a short production stoppage:

"In the project, the existing Siemens S5 control systems of both super calenders were replaced with a new Siemens one S7 with user interface

to the TIA control system. At the same time, some of the electrical and control components were renewed.

The project was very challenging, because it had to be implemented only during a short production stoppage lasting four days," says Setälä.

The renovation of the super calenders was done in stages so that the system of the first calender started to be dismantled at 6 o'clock and the system of the second calender ten hours later, at 4 o'clock. Scheduling is an important precaution so that, if necessary, it would be easier to restore another super calendar to its initial state. Fortunately, there was no need to resort to contingency plans, as the project went as expected:

"During the four-day production stoppage, changes were made to both super calenders and the changes were scheduled to overlap slightly. The old control systems were dismantled and the new control systems were installed, followed by testing and mechanical trial operation. Despite the very tight schedule, the machines were put into operation and into production on time," says Setälä.

The project as a whole went well and even better than expected. As a result of the project, the operational reliability and efficiency of the super calenders improved significantly. In addition, the life cycle of the super calenders was significantly extended, because with the new systems it is also possible to ensure the availability of spare parts for components in case of possible failure.

Both parties were satisfied with the project and the cooperation within its framework.

Long life for devices with maintenance and repair

Enmac offers comprehensive maintenance and repair services that prevent breakdowns and extend the life cycle of devices. You can count on us to support you in all situations and help you make the most of your devices. With our **Service & Retrofit service**, you will ensure reliable maintenance, maximum usability and a long service life for your devices.

Pekka Niinilammi, who works as a contact person for Service & Retrofit services at Enmac, says:

Our life cycle assessment gives you a clear picture of the state and life cycle of your devices. We offer you suitable maintenance programs that optimize the reliability and performance of your equipment. In addition, our life cycle assessment will suggest you the best renewal and upgrade options that will extend the life of your devices.

The Enmac Service & Retrofit service also offers you digital solutions and expertise that help you make better decisions. Benefit from real-time monitoring of your devices' performance and energy consumption, which facilitates the development of your business and cost management.

You get the best benefits by combining our connectivity solutions, data analysis and service expertise. By analyzing the data collected from your devices, you get more detailed information about the status and possibilities of your devices. You can take advantage of analyzed data and our extensive maintenance expertise to make comprehensive business decisions.

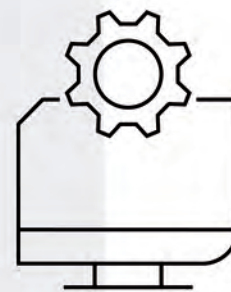
When you encounter unexpected problems, our experts are ready to help you. Our service includes fast repairs at the place of use. We restore your device to working condition quickly

and reduce losses caused by interruptions. Our experienced and skilled engineers are in control of various devices and situations.

With the help of the Enmac Service contract, you can keep your equipment in reliable and efficient working condition throughout its entire service life.

As your partner, we offer you top maintenance expertise, uniform processes and advanced technology. We help you plan, coordinate and implement maintenance according to the criticality and needs of your equipment.

A customized operating model supports budgeting and the implementation of maintenance in the long term."



Service & Retrofit

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The electrical automation systems of **UPM Communication Papers Oy**'s production equipment in Rauma were replaced with new ones during the four-day production shutdown. At the same time, part of the electrical and control components were renewed. In this way, the life cycle of functioning devices could be extended.

North European Oil Trade Oy (NEOT) is a fuel procurement and logistics company owned by St1 and the S group. Neot delivers fuel for its owners in Finland, Sweden and Norway. On an annual basis, the company operates more than 200,000 fuel oil deliveries: NEOT annually delivers approx. 6 billion liters of traffic fuels to more than 1,700 stations, fuel oil to hundreds of thousands of homes and businesses through dealers, and significant amounts of fuel for ships and aviation. At the core of NEOT's operations is ensuring safe and efficient fuel deliveries.



CUSTOMIZED LOADING ARMS

for safe loading of fuel liquids

At **NEOT's** Oulu terminal, there was a need to replace the old and high-maintenance loading arms of the tank trucks, which had been in use for 25 years, with new and modern ones. The old loading arms had served for a long time, that is, their joint components were already badly worn. The old loading arms were also stiff and heavy to handle, which partly indicated that they were at the end of their useful life. Instead, they wanted customized but similar loading arms as before, which would also make it easy to install them in the existing pipeline.

The new loading arms were purchased specifically to improve the usability and ergonomics of the arms, but also to smooth out the loading and unloading processes. In addition, the new loading arms enhance the safe handling of fuels.

At first, Enmac carried out a laser scanning of the loading area, based on which the new loading arms could be dimensioned to be installed in the current pipeline. The design of the loading arms took into account the customer's special requirements for accessories, such as limit switches and traffic lights: with these, the tanker driver can be informed when it is safe to arrive at the loading location and, accordingly, when it is safe for the vehicle to start moving. As agreed, Enmac delivered a customized solution, which included new loading arms, limit switches and traffic lights.

St1's technical manager is satisfied with the project and especially with Enmac's ability to customize the solution exactly as desired: "Enmac was willing to customize the equipment of the loading arms exactly according to NEOT's needs. It was particularly important for

us to have functional home station sensing, which prevents the truck from starting when the loading arm is still attached to the vehicle. In addition, we wanted traffic lights at the loading site to facilitate the loading and unloading processes and of course to ensure safe working."

Enmac's project manager **Aleksi Korkee** reviews the project: "The loading arms were installed in a space that was a bit cramped, which brought its own challenges to the design. However, this was tackled well by laser scanning the area. The great thing about the project was that the client was very involved and interested in how the project was progressing, so also the questions that arose were answered quickly. It contributed to the smooth implementation of the project without additional stops that could have affected the delivery time," Korkee specifies.

St1's technical manager describes how the cooperation in the project went really well: "We received information from Enmac every month about the progress of the project, which means we were kept well informed of the situation. We found this to be very useful, which strengthened our confidence in the project's management even more. In addition, the documentation of the loading arms was of really good quality, which was a positive surprise for us!"

"The delivery of the loading arms from Enmac was of high quality and within the agreed schedule - Enmac's loading arms are easy to use and the movement trajectories work as planned. There has also been really positive feedback from tanker truck drivers," says Aalto.

Jyri Halkola from the Kotka office works as the contact person for loading and unloading site

Safe loading and unloading processes

projects at Enmac. He has years of experience in modernizing loading and unloading areas and in system deliveries. Jyri says that loading and unloading arms are used in terminals and plants for loading and unloading various liquids, for example chemicals and fuels, from the plant's process to a tank truck or train.

Loading and unloading arms are available as both upper and lower arms, which enable loading or unloading the tanker without hoses.

We have experience in the modernization of more than a hundred loading and unloading areas over a period of ten years. Today we can name ourselves as Finland's largest equipment supplier of customized loading and unloading arms!

With the loading and unloading arms, the loading or unloading process can be carried out safely and ergonomically, because the arms avoid the handling of heavy hoses and the risk of leakage and tripping caused by the hoses. The arms can also be implemented with pneumatic balancing aid, which makes handling really effortless.

Enmac's loading and unloading arms are CE-marked products suitable for use in ATEX areas. They meet the requirements for chemical pipelines according to the Finnish Government Decree (856/2012).

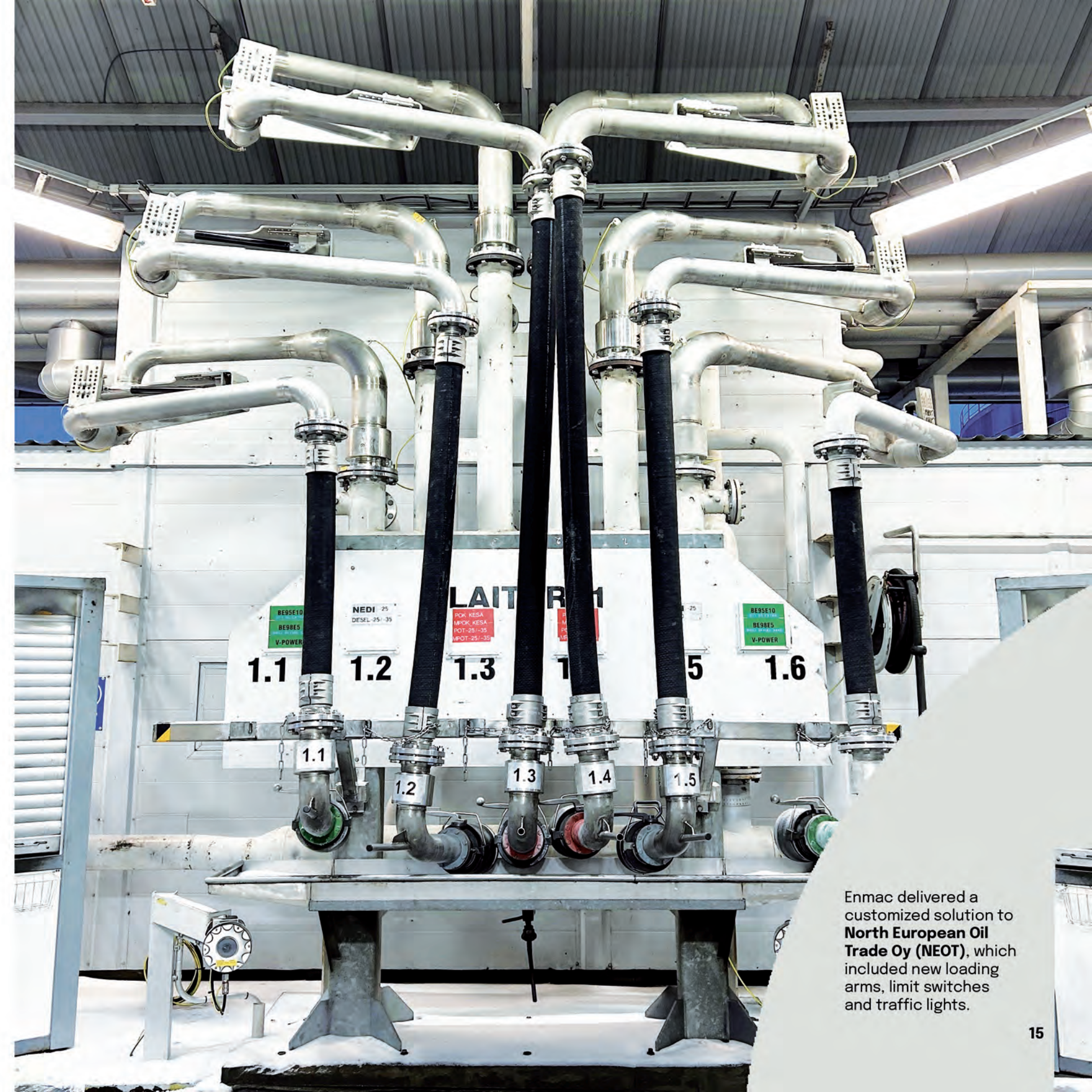
The dimensioning and functions of the loading and unloading arms are carried out so that the arms are suitable for use with the safety structures of the loading area and so that they are suitable for the customer's loading process. We always customize the materials and equipment of the arms according to the need and requirements.

Scan the QR code and watch a video about our loading and unloading site design services.



More information about loading and unloading arms:

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Enmac delivered a customized solution to **North European Oil Trade Oy (NEOT)**, which included new loading arms, limit switches and traffic lights.

ENMAC – A PROBLEM SOLVING COMPANY

Get to know our services and locations

Do you have a problem for us to solve? We are most inspired when we first turn your problems into challenges and then into solutions. So don't hesitate to share your problems with us - we are interested in them. We are a problem solving company!

We solve problems in the following areas:



Mechanical engineering

We design machines, devices and structures for various industries. We offer comprehensive design services for projects of various sizes, always within the agreed budget and schedule.



Electricity and automation

We design and implement all electrical and automation solutions regardless of the industry. Our services cover the entire life cycle of electricity and automation, from preliminary planning to commissioning. Of course without forgetting the support services during different stages of equipment's life cycle.



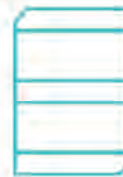
Plant, pipeline and process design

We offer plant, pipeline and process planning comprehensively. We implement solutions that include planning, monitoring and implementation. We operate reliably, professionally and customer-oriented.



System deliveries

We provide system deliveries on a turnkey basis for different industries. Our system deliveries include everything from specification to commissioning.



Chemical loading and unloading stations

We offer design and installation services of loading and unloading systems as well as safety structures for various purposes and needs, such as industrial facilities. Our services always comply with relevant regulations.



Environmental services

We offer diverse energy efficiency and environmental services such as surveys, environmental impact assessments and sustainable development planning. We help you save energy and reduce the environmental impact of your business.



Digitalization & IIOT

We digitize production processes to this day. We transfer the data coming from the sensors of the production line devices to a secure network and translate it into clear information that can be read on different end devices. Our service covers the entire chain from planning to implementation.



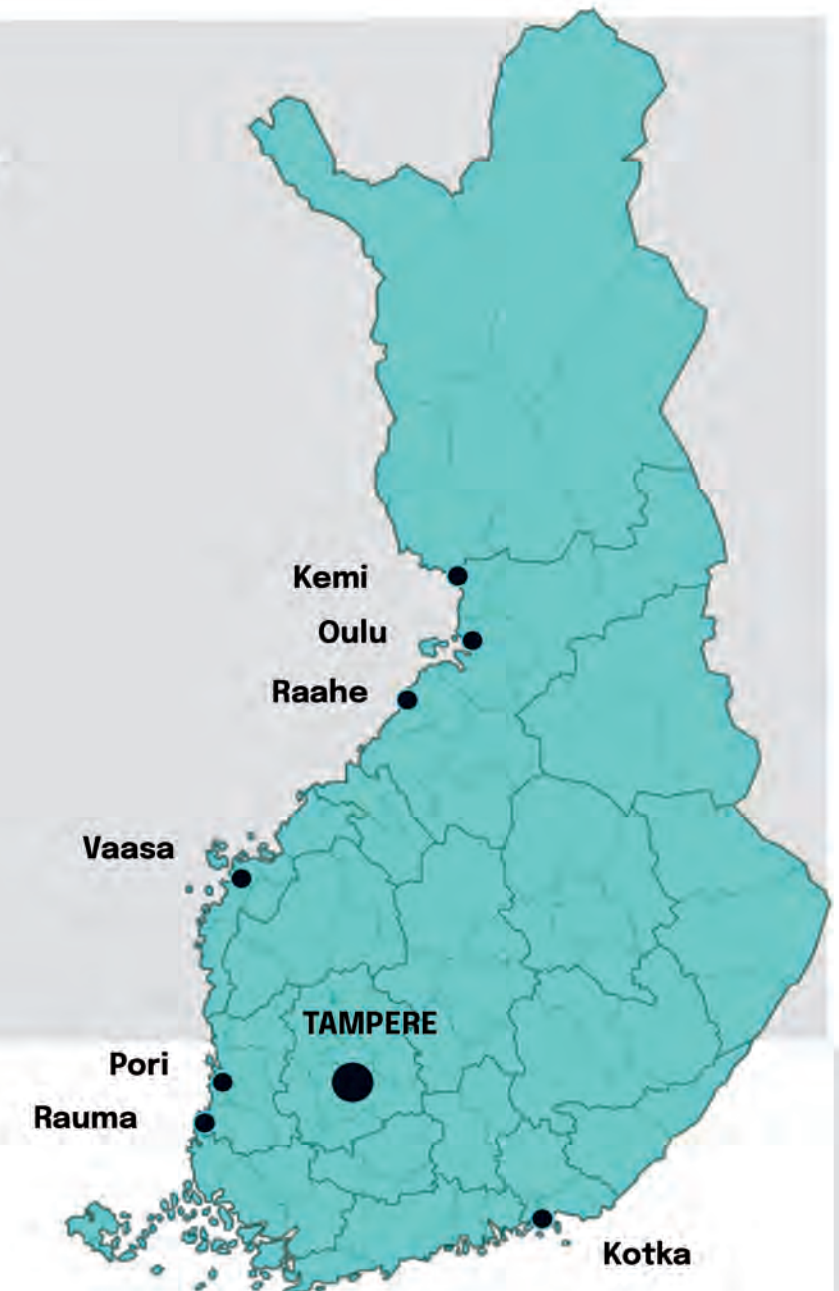
Service & Retrofit

We digitize production processes to this day. We transfer the data coming from the sensors of the production line devices to a secure network and translate it into clear information that can be read on different end devices. Our service covers the entire chain from planning to implementation.

We build a responsible engineering office one act at a time. Everything is not ready yet, but we are on a clear and direct path towards responsible operations. Our work is high-quality and comprehensive, we are especially known for our comprehensive system deliveries.

We are a humane and face-to-face operator with whom you always get personal service. We act according to the customer's needs, never the other way around!

*FUTURE
WORKPLACES
'23*



Fescon Oy, founded in 1984, is the largest Finnish developer and manufacturer of mortar, sand and coating products and solutions for the construction industry. Fescon helps professionals in the different stages of construction in choosing both solutions and products. Fescon's factories are located in Hausjärvi, Haukiputaa, Ikaalinen, Harjavalta and Tuusula.

NEW SOLUTIONS TO SUPPORT COOPERATION

Installation accuracy and demonstrability with 3D laser scanning

Traditional measuring, photography, sketching and modeling of the environment have been left in history! 3D laser scanning as a method of describing the environment is fast, flexible and accurate. Laser scanning improves work safety and enables difficult measuring even in dangerous places.

3D laser scanning is a method that uses laser beams to obtain accurate three-dimensional measurements without touching the object. The frequency of the laser beams can be adjusted according to the scope of the object to be measured, the purpose of the scanning and the accuracy requirements. The target is usually scanned from several directions, thus achieving a uniform cloud of points and avoiding covered areas.

3D laser scanning has been utilized in **Fescon Oy's** projects, among others. Fescon Oy is a developer and manufacturer of mortar, sand and coating products and solutions for the construction industry and industry.

Fescon Oy relies on Enmac's know-how in the continuous change and development of its own production. Enmac has been involved in developing and modifying Fescon's production lines for the manufacture of new products, increasing capacity and improving the efficiency of production lines. In the past, Enmac has also been involved in developing the ecology and environmental safety of factories, for example by improving energy efficiency and dust and noise control. This has been a long-standing collaboration:

"For more than 15 years, we have trusted the work of Enmac (then PJT-Engineering Oy).

The cooperation is smooth and professional", says Fescon Oy's Business Director **Eero Majanen**.

Enmac provides Fescon with a wide range of planning and project management services. We do pre-planning, cost estimates, mechanical, pipeline and steel structure planning, strength calculations and other technical calculations. In addition, we take care of the comprehensive management of projects, including offer inquiries, procurement, scheduling, installation supervision and documentation.

3D laser scanning offered by Enmac has brought considerable benefits. In particular, the 3D design model added to the real point cloud environment has increased the demonstrability of project plans:

"Enmac's laser scanning service, as part of the design, has enhanced and raised the level of installation accuracy and demonstrability, among other things. We already know exactly what the structures look like and how the structures fit among existing complex and cramped structures. The laser scanner is a multipurpose tool. We can also use it to inventory piles of material, for example," says Fescon's Majanen.

Enmac's design manager Jani Savela states that the cooperation has deepened over the years:

"At Enmac, we feel that we have gotten to know Fescon over the years and have built a confidential cooperation. Thus we have also been able to develop as a service provider and have been able to be part of Fescon's success story".

We will tell you more about our laser scanning service at the next opening.

Advantage with advanced methods

"We acquired a 3D laser scanner a few years ago so that we can demonstrate our plans to the customer more flexibly and accurately. In addition, we wanted to be able to respond well to the competition in providing services," says Enmac's design manager Jani Savela.

Laser scanning can be used for a wide variety of purposes. Typical industrial objects are existing facilities. An accurate 3D model of the facility is desired for various purposes. Laser scanning can be used to document and describe environments in 3D, improving the efficiency and productivity of field and office work thanks to fast, easy-to-use, accurate and portable hardware and software.

With the help of the scanner, we manage complex projects with accurate and reliable 3D representations, which also clarifies the possibilities and limitations of the construction site. The environment is obtained as a 3D point cloud directly into the design program, which contributes to speeding up the flow of the project.

In particular, the 3D design model added to the real point cloud environment has increased the illustrativeness of project plans, this is what our customers have been most satisfied with. In this way, a more realistic picture of the planned solutions is conveyed to them, which in turn helps in solution making and in achieving exactly the end result the customer is aiming for.

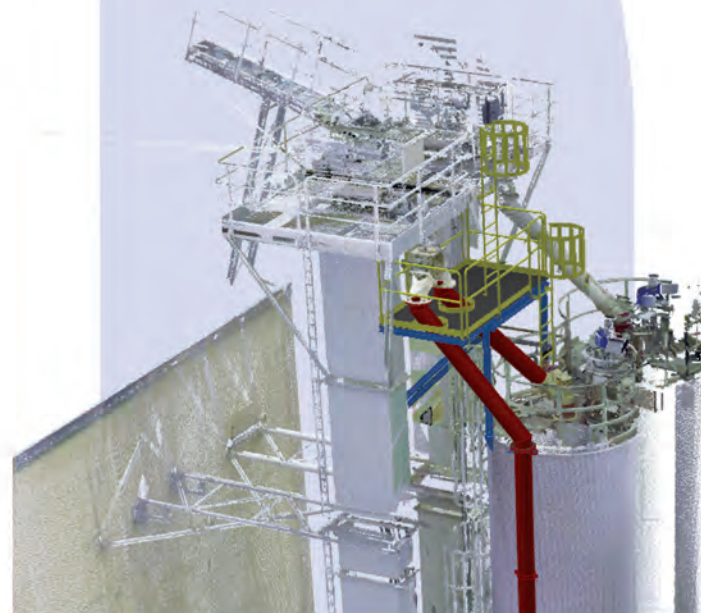
Once scanned, the object and the point cloud compiled from it can be used for several purposes, such as change planning, space check, making a virtual factory tour or even for preparing various instructions.

"It could be, for example, the need to place a new device in the current facility, in which case .

it is easy and quick to carry out a space examination and the necessary change plans accurately using laser scanning. The laser-scanned environment can be combined with an existing 3D model, and the combination can be used to model new structures with 3D design software.

3D laser scanning as a measurement solution is part of our design services. We also deliver separately processed point cloud models for different customer needs.

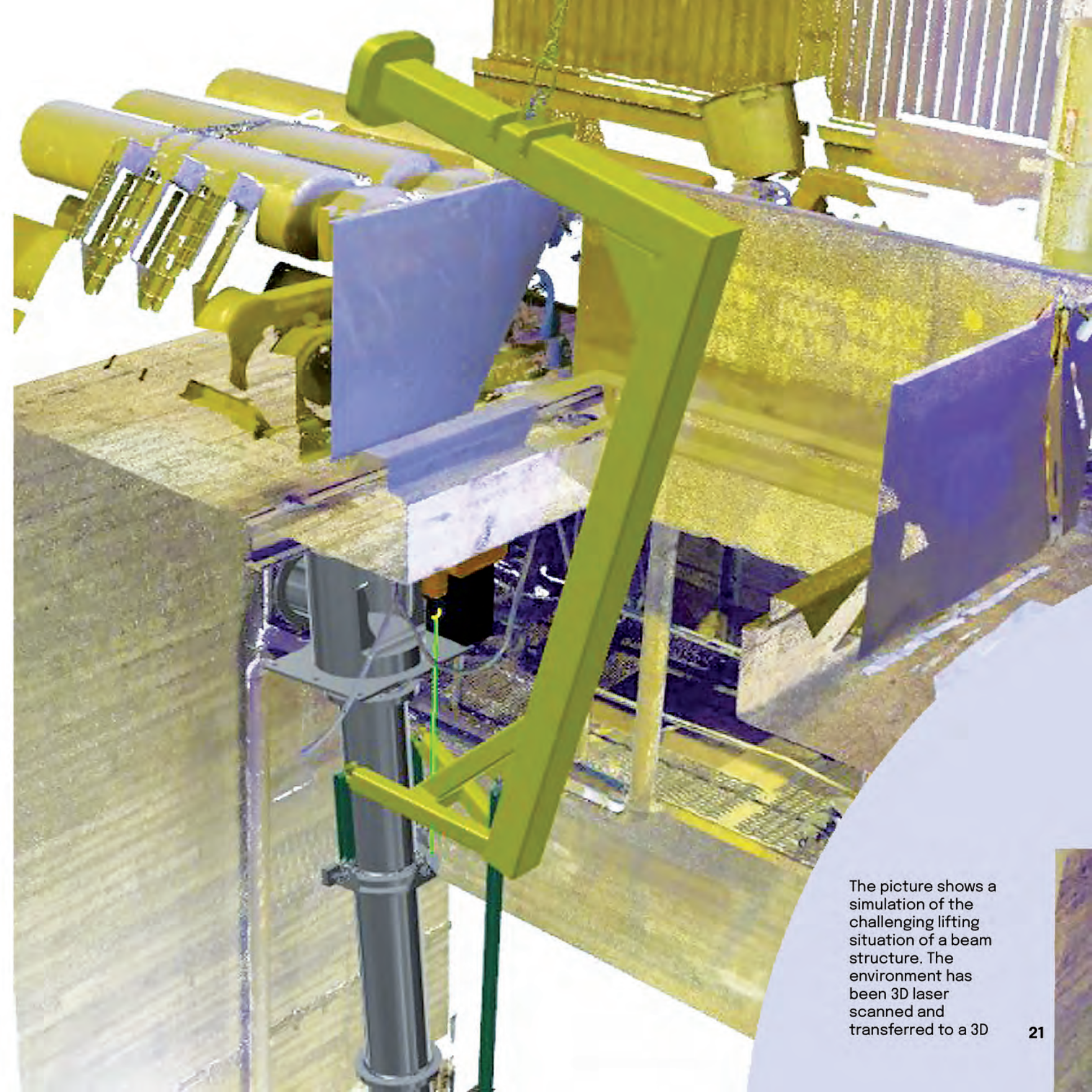
Below is a picture of the service platform and pipes designed to the 3D scanned existing environment.



More information about 3D laser scanning:

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The picture shows a simulation of the challenging lifting situation of a beam structure. The environment has been 3D laser scanned and transferred to a 3D

ELECTRICAL SAFETY STRUCTURES

improve the loading of chemicals in Joutseno

At **Kemira Chemicals Oy**'s Joutseno plant, there was a need to improve the safety of the plant's lye and hypochlorite loading lines. In the old loading location, safe access to the tanker truck was not taken into account, which also slowed down the loading processes.

The modernization project started with a preliminary design carried out by Enmac, which defined the new fall-preventing safety structures for the loading area as well as other necessary changes and extensions to the previous loading area. In addition, necessary plumbing changes were taken into account to facilitate operation and maintenance.

*Kemira's project manager **Petri Myller** says that Enmac was selected as a partner for the loading station modernization project for several reasons: "From our point of view, the ease and smoothness of the project was a significant factor in the selection process. We couldn't find equipment on the market that was technically suitable for us, but Enmac was able to deliver exactly the equipment that we needed," says Myller.*

Enmac designed an extension part for the loading area, which made it possible to place safety structures at the loading area. With the help of safety structures, loading can be carried out safely and efficiently. Based on preliminary planning, the customized electrically operated safety structures were dimensioned to fit the structures of the expanded loading area and the equipment in use, i.e. the project was able to utilize the structures that the customer already had. In addition, during the planning and installation phase, it had to be taken into account that the second loading line had to be

available at all times, so that the normal operation of the factory would not be disturbed. The installations were carried out according to the plans.

Enmac's project manager **Tomi Järvinen**, who worked as site supervisor in this project, says that the scope of the project brought its own challenges:

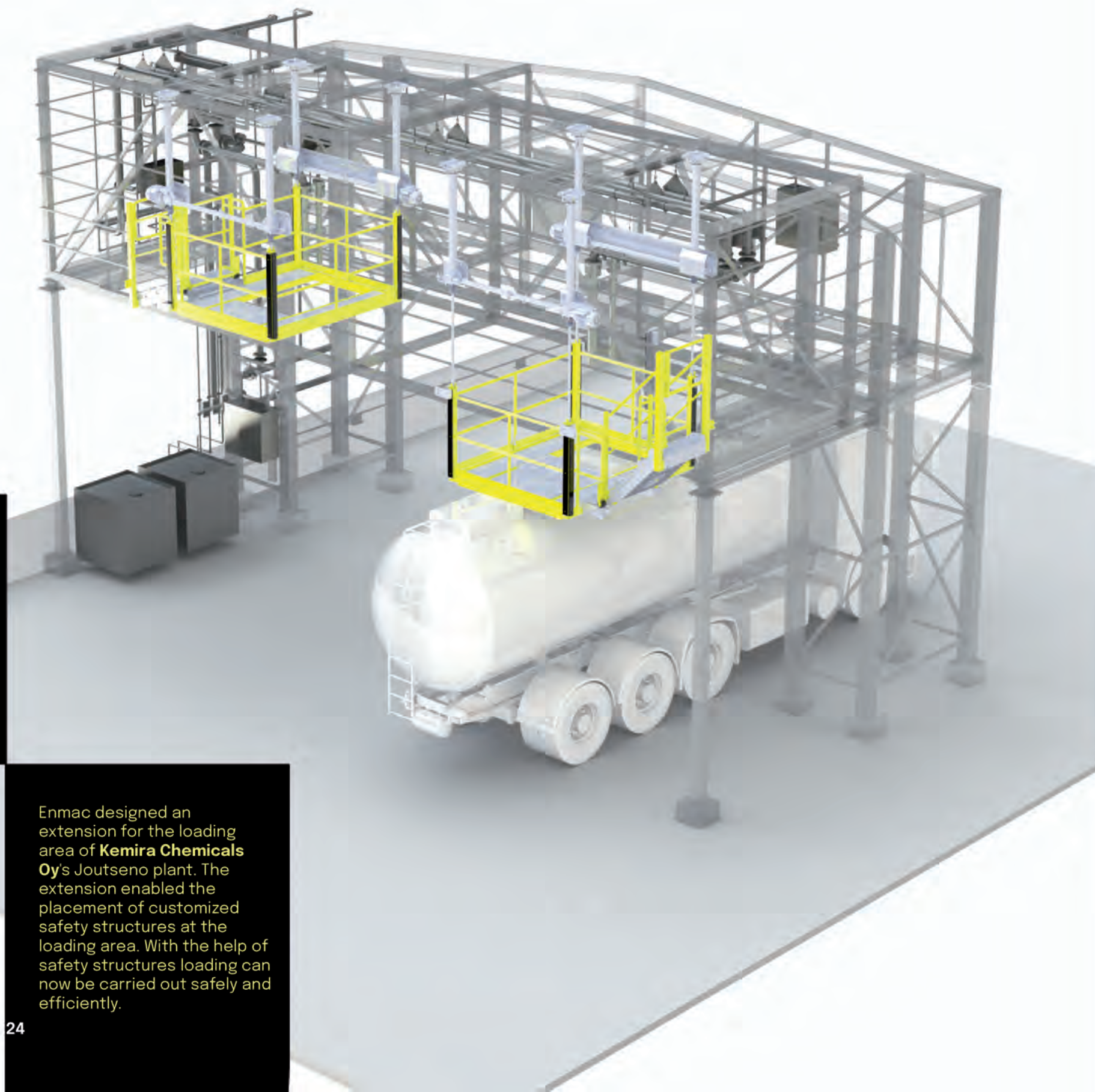
"The project was quite challenging. At least one loading line had to be kept operational. Due to the scope of the project, various changes and additional work also appeared, which had to be resolved at a fast pace so that the completion wouldn't be delayed. However, the result was in line with expectations, after the project was completed. I was happy to go back to the office to work on new challenges. This was certainly the most interesting and rewarding project I've ever been involved in," Järvinen rejoices.

In this project, Enmac's scope of delivery included, safety structure delivery, the design, manufacture and delivery of the steel structure and foundations and pipelines of the expansion part. After the equipment delivery, Enmac carried out the equipment installations and the necessary expansion work at the loading site, including earthworks, foundations, steel structures and pipelines. The construction site was defined as a construction site, which brought additional requirements for monitoring work safety and operating on the construction site. In addition to equipment installations and construction work, Enmac was responsible for the management and safety of the entire construction site.

Petri Myller from Kemira describes cooperation with Enmac as effortless:



Kemira Chemicals Oy manufactures chemicals for industrial needs in several locations in Finland and around the world. The company's products include sodium chlorate, sodium borohydride and chlorine dioxide, which are used in mass bleaching and water purification. The company develops solutions for its customers that create a profitable and sustainable future.



Enmac designed an extension for the loading area of **Kemira Chemicals Oy's** Joutseno plant. The extension enabled the placement of customized safety structures at the loading area. With the help of safety structures loading can now be carried out safely and efficiently.

Solid experience in safety structures

"We achieved synergistic benefits, i.e. we were able to acquire both the design and equipment delivery from the same supplier, which simplified the project considerably from our point of view. The whole cooperation worked excellent - project management and installation supervision went very well. In addition, the response times were short and things were taken up quickly, meaning the project progressed according to the schedule," he tells.

Since 2014, Enmac has delivered various solutions in accordance with requirements and regulations for loading and unloading places.

Jyri Halkola from Kotka, who works as a contact person for safety structures at Enmac, says:

"Our service covers preliminary study, design, equipment delivery, installation, testing and commissioning. The customer's requirements and wishes are the starting point on which we tailor the best solution. We know how to take into account the special requirements of different areas."

We also have a 3D laser scanning tool that allows us to document and describe existing environments in 3D and transfer the data to our design software to guide the design.

At chemical loading and unloading sites, it is of the utmost importance to pay attention to occupational safety and ergonomics, but in addition, the development projects of the sites are also guided by the requirements and regulations set by environmental legislation.

At Enmac, we have accumulated solid experience in development projects aimed at safe working, for example in factories or areas where vehicles or trains are loaded and unloaded - thanks to this, we offer reliable systems tailored to each

project and needs. We deliver CE-marked safety structures and loading arms on a turnkey basis.

CE-marked and easy-to-use safety structures offer a reliable solution for safe working at height. Our safety structures are suitable, for example, for the unloading and loading places of tank trucks and trains in factories and liquid terminals. The model-protected frame of the safety structure meets the ergonomics and safety requirements of the SFS-EN ISO 14122-3 care level standard.

We customize the safety structure with the functionality you want, cost-effectively. Our safety structures are suitable for explosive environments according to ATEX legislation."

Scan the QR code and watch a video about our service concept.



More information about our safety structures:

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WhiteOut^t

HEAVY DUTY ROOF SCRAPER

Enmac has designed a snow removal device called WhiteOut to facilitate the cleaning of the roof of trucks and tall vehicles.

HEAVY DUTY ROOF SCRAPER

prevents dangerous situations in traffic caused by snow and ice

Snow and ice falling from the roofs of tall vehicles are a real safety risk in winter traffic conditions. Enmac has developed a new, simple concept for this problem; WhiteOut – a roof scraper for trucks and tall vehicles that reduces the risks caused by snow and ice in traffic.

Each of us can relate to the challenges of cleaning a snow-covered vehicle. Especially with heavy equipment, cleaning the roof is time-consuming, difficult and, at worst, dangerous, if you have to climb high to clean the roof. Therefore, Enmac has designed a snow removal device called WhiteOut to facilitate the cleaning process of the roof of heavy equipment.

WhiteOut is a drive-through steel structure, where snow removal is handled by the plow blade of a vertically moving sledge and a snow brush. The user drives the vehicle under the device and lowers the device's sled to the level of the roof of the vehicle and the snow. After this, the user slowly drives his vehicle through the device, so that the snow is safely dropped from the roof and the brush completes the track. The snow thrower is suitable for flat-roof vehicles with a width of 2.0–2.6 meters and a height of 2.6–4.4 meters.

Snow on top of heavy equipment is dangerous, especially in road traffic when it falls from a height onto or in front of the vehicles behind. The law also obliges to pay attention to safety: according to the fourth section of the Vehicle Act, the structure, equipment, external shape and material of the vehicle must not cause danger. Enmac's snow removal device can ensure that dangerous situations do not arise and at the same time it saves drivers' time by speeding

up the roof cleaning operation.

With WhiteOut:

1. You clean the roof of your high vehicle quickly
2. You avoid disastrous traffic accidents
3. You keep your equipment in good condition

The WhiteOut snow removal device can be installed, for example, in connection with logistics centers or gas stations.

Get your own scrub and safe driving kilometers from us! Scan the QR code and see how WhiteOut works!



Ask more about the WhiteOut snow removal device:

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WhiteOut^t

HEAVY DUTY ROOF SCRAPER

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