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Ready for digitisation: Leading European natural gas and oil production company rebuilds plant with passive infrastructure from tde – trans data elektronik

Drastically reduced shutdown times: Wintershall Dea relies on tML system platform

Business-critical applications in plant engineering must function reliably at all times. Harsh environments represent an additional challenge. To rehearse possible failures and keep shutdowns as short as possible during maintenance, companies need a highly available and fail-safe passive network infrastructure. Otherwise, malfunctions, software changes or maintenance work can cause the entire plant to come to a standstill. In order to increase the high availability of its plant and to be prepared for the requirements of digitisation, Wintershall Dea renewed its complete process network with all fieldbus systems at the Langwedel-Holtebüttel site in the district of Verden/Aller. To this end, the natural gas and oil production company massively expanded its passive infrastructure with the help of network expert tde – trans data elektronik GmbH. The success is clearly visible: by decoupling the plant sections from the control system, Wintershall Dea can reduce the annual shutdown of the entire plant from 7-10 days to 1-2 days.

Wintershall Dea's central gas drying plant, built in 2004, feeds natural gas into the Lower Saxony pipeline network. It is based on the fieldbus infrastructure and offers decisive advantages against the background of the constantly growing demand for data and information – for example when measuring points have to be expanded. "A structured and high-quality cabling of the process control and fieldbus systems is the basic prerequisite for us to be able to further advance digitisation", explains Hans Joachim Hempel, Head of Electrical, Measurement and Control Technology at Wintershall Dea. "At the same time, the network infrastructure is essential for the safe and

trouble-free operation of our plant".



"A structured and high-quality cabling of the process control and fieldbus systems is the basic prerequisite for us to be able to further advance digitisation. At the same time, the network infrastructure is essential for the safe and trouble-free operation of our plant", explain Hans Joachim Hempel (left), Head of Electrical, Measurement and Control Technology, and Markus Alterbaum, Electrical, Measurement and Control Technology at Wintershall Dea.

Picture source: Wintershall Dea

Specific challenges of the project

Wintershall Dea has been relying on the high-quality network components of its solution partner – the quality provider tde trans data elektronik since 2014. Due to the very good and many years of experience with the network expert, the decision was also made in favour of tde for the new plant. Specific project challenges also played a decisive role here: "It was important for us to be able to configure the fibre optic cables individually and label them at the factory – because this offers decisive advantages in the event of a malfunction", explains Markus Alterbaum, Electrical, Measurement and Control Tech-

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nology at Wintershall Dea, and continues: "In addition to the central aspects of 'high availability' and 'quality', we also wanted a solution for orderly patch cable management and compact switch cabinet expansion". When implementing the solution, tde also had to consider the special environment: important parts of the system are located in harsh and potentially explosive environments. "The tde components had to be integrated into explosion-proof fibre optic sub-distributors within the fieldbus structure. This required close cooperation with the explosion protection specialist R. Stahl", says Alterbaum.



Wintershall Dea renewed its complete process network with all fieldbus systems at its Langwedel-Holtebüttel site in the district of Verden/Aller and massively expanded its passive infrastructure with the help of network expert tde – trans data elektronik GmbH.

Picture source: Wintershall Dea

Teamwork for the new infrastructure

In 2017, tde trans data elektronik developed the concept together with Bilfinger EMS GmbH and Wintershall Dea. As professionals in their fields, the network expert and the planning service provider have been in contact since 2010. In this case, too, the two worked closely together: After Elmar Herwig, Sales Consultant at tde, had discussed the technical specifications of the plant in detail with Andre Heinke and Jörg Landwehr, project handling E/MSR technology Engineering/plant construction at Bilfinger EMS, he determined the required tde

components. The complete technical specifications for all components and assemblies provided by tde proved to be of great help in this process: "The detailed data sheets provide information on the optical and electrical damping properties of the connection components and supply important parameters for the cabling such as longitudinal, crush resistance or tensile strength, exact temperature ranges and many other aspects", explains Herwig.

From the very beginning, all project participants were in constant and close contact. During the planning phase, the detail engineering specialists from Bilfinger EMS worked closely with Wintershall Dea and tde. They optimised the time schedules in order to meet the customer's deadlines and quality requirements.

This proved to be a particular advantage when dealing with problems: tde was able to solve special challenges, such as the switch cabinet design, comprehensively, quickly and satisfactorily by making suggestions.

The local and environmental conditions and Wintershall Dea's requirement to set up the new network structures parallel to the ongoing operation of the plant and to convert them within the tight timeframe of the shutdown also proved to be special tasks during the conceptual design, planning and execution. The space-saving modular components as well as the pre-assembled and pre-tested cabling of tde represent an ideal solution.

"From a planning point of view, the tde solution convinced us in many respects", says Andre Heinke, Team Leader Project Processing E/MSR Technology Engineering/Plant Engineering at Bilfinger EMS, and continues: "The tML network components integrate very well into new, existing and control cabinets to be rebuilt. Since the cabling components are fully assembled and pre-tested, they can be installed during ongoing plant operation to save time and money and are characterised by high quality. Another positive feature is the ability to individually label fibre optic trunk and patch cables: detailed pre-planning saves time during installation. Since tde supplies all components from a single source and as suitable modular systems, the cabling can be used flexibly and modularly within

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the project, depending on the application. And last but not least, the network expert scores with on-schedule delivery and processing".

The preparatory work took place during the 2018 shutdown. The installation on site was carried out by the tde certified company Schulz Systemtechnik GmbH together with tde construction and project manager André Dierkes. During civil engineering work, the employees laid the new fibre optic cables, carried out the switch cabinet construction, prepared the interfaces, set up additional fieldbus components and installed explosion-proof fibre optic sub-distributors. After completion of the installation work, the project team inspected the newly installed fibre optic cables and put them into operation. In April 2019, Wintershall Dea was able to connect the test peripherals to the newly installed components and successfully simulate the existing plant components.

In August 2019, the gas and oil company shut down the plant and converted the existing infrastructure to the new one. This was put into operation smoothly on August 30th, 2019. After a lead time of three years, this marked the end of a complex project: "Admittedly, the passive infrastructure is only a small part. But a very important one – because nothing works without the central nervous system", says Elmar Herwig.

tML is the trump card

The tML modular cabling system is used in the Wintershall Dea plant. The tde Modular Link System consists of the three core components module, trunk cable and module carrier. The network technicians at Schulz Systemtechnik GmbH were able to carry out the plug-and-play installation on site within a very short time using the system components, which were 100 per cent manufactured, pre-assembled and tested in Germany. At the heart of the system are the MPO/MTP connectors at the rear, which can be used to connect at least six or twelve ports at once. Fibre optic and TP modules can be used together in a module carrier with a very high port density.



Wintershall Dea uses the modular tML platform with 48 ports, allowing 96 fibres to be used on a single height unit. During implementation, tde took into account older specifications from the former structure of the plant.

Picture source: Wintershall Dea

Wintershall Dea uses the 48-port tML platform, which allows 96 fibres to be used on a single height unit. During implementation, tde had to take into account older specifications from the former structure of the plant. "Our cabling system is available in all fibre specifications and also with unusual plug-in faces", says André Engel, managing director of tde. Both were available in the present case: Bilfinger EMS designed the tML in parts with existing 62.5µ OM1 and newly laid OM3 multi-mode fibres. A large number of fibre optic trunks are based on

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the ST connector, in other structures Bilfinger and tde rely on LC connectors. This also resulted in different cabling options: for example, some Schulz Systemtechnik GmbH employees completed cable assemblies in the tML platform directly in the ST partial front panel via MPO fanouts.



Thanks to tML, Wintershall Dea benefits from the best possible commissioning, high availability and reliability. At the same time, shutdown times can be massively minimised, saving the company time and money.

Picture source: Wintershall Dea

Since the network engineers also laid and connected the passive cabling in environments that are potentially explosive and exposed to the elements, a large number of fibre optic trunks are based on the robust ST connector. The ST connectors and up to four tML partial front panels can be used to accommodate up to 48 fibre optic cables as a patch level in the tightest of spaces, particularly in explosion-protected sub-distribution boards.



The challenge of a harsh environment: The tde components had to be integrated into explosion-proof fibre optic sub-distributors within the fieldbus structure.

Picture source: Wintershall Dea

The OM3 fibres use LC connectors in combination with tML modules with integrated shutters: the metal shutters open and close automatically via a special mechanism and ensure the transmission quality of fibre optic cabling. The backspace cabling is based on MPO technology. Due to the harsh environment, the fibre optic trunk cables designed by the project team are universal cables: they offer rodent protection, offer better longitudinal, crush resistance and tensile strength in cable routes across campuses, through buildings and when crossing fire compartments.

Thanks to tML, Wintershall Dea benefits from the best possible commissioning, high availability and reliability. At the same time, shutdown times can be massively minimised, saving the company time and money. With the tML system, Wintershall Dea also benefits from a particularly high-quality solution: "As the only German network expert we can offer our customers the very high TL 9000 quality standard based on ISO 9001", explains André Engel and continues: "All the materials we use

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in tde production are subject to special quality control – world-wide. This ensures high availability".

In addition to the high quality, tde also had to organise the material flow to the construction site well: The aim here was to adhere precisely to delivery times and to clearly label the packages in order to avoid misunderstandings.

The tML system: Smart, individual, user-friendly

The project managers are highly satisfied with the quality of the tML solution and the execution of the installation: "The tML system covers all our needs and implements them in a smart and user-friendly manner – especially its individuality, modular structure and cable management are convincing", says Hans Joachim Hempel. "The structured and neat cabling with the option of individual labelling is extremely clear and offers enormous advantages in the event of faults or errors. If we have to work on the infrastructure or make extensions, we can now also do this safely during operation, since we can minimise the risk of accidental mix-ups of ports or fibres". tde also receives positive feedback for the cable management solution: "The possibility of laying the patch cables gently and safely in the patch cable guide tray promises longevity and reliability", says Hempel.



The patented modular cabling system consisting of the three key components module, trunk cable and rack mount enclosure. It offers an extremely easy and fast migration to higher transmissions rates up to 400G.

Picture source: tde – trans data elektronik GmbH

As with previous projects, Wintershall Dea draws a consistently positive conclusion from this project: "We have long relied on tde for advice, problem and system solutions, modular design, quality and service. The network expert also convinced us with his individual configuration, labelling options and short delivery times for the current project. It fully met our high expectations", Hans Joachim Hempel sums up.

The ongoing digitalisation will continue to play a decisive role for Wintershall Dea as a globally active company in the future: "The reliable passive infrastructure is a success factor", says Alterbaum, "because it forms the basis for many applications. That is why we will continue to work on expanding this infrastructure, focusing as usual on quality, scalability and modular structure. And thus on tde.

About tde – trans data elektronik GmbH

For more than 25 years the tde – trans data elektronik GmbH, an internationally successful company, has specialised in the development and production of scalable cabling systems for highest packing density. The nuclear research centre CERN relies on the know-how of the leading company in multi-fibre technics (MPO) as well. The company's portfolio "Made in Germany" contains complete system solutions with a focus on Plug-and-play for high speed applications in the field of datacom, telecom, industry, medical and defence. tde offers both planning and installation services through its own service department and supports the "European Code of Conduct" when it comes to energy efficiency in data centres. For more information, visit www.tde.de

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About Wintershall Dea

The merger between Wintershall Holding GmbH and DEA Deutsche Erdoel AG, two successful enterprises with a long tradition, has created Europe's leading independent natural gas and crude oil company: Wintershall Dea. The company, which has its roots in Germany and is headquartered in Kassel and Hamburg, explores for and produces gas and oil in an efficient and responsible manner in 13 countries worldwide. With activities in Europe, Russia, Latin America and the MENA (Middle East & North Africa) region, Wintershall Dea has a global upstream portfolio and also operates in midstream business through its stakes in natural gas transport firms. Wintershall Dea embodies more than 120 years of expertise and experience as an operator and project partner throughout the E&P value chain. The company employs around 4,000 people from more than 60 countries all over the world. The company aims to increase the average daily production in 2018 from around 590,000 barrels of oil equivalent by 2023 to around 750,000 barrels of oil equivalent.

About Bilfinger EMS GmbH

Bilfinger EMS GmbH is a company that specialises in providing services for the entire lifecycle of industrial facilities. The services range from consulting, development, planning, assembly and installation to plant maintenance and operation. The company focusses on offering its customers exactly what they need, both in terms of project support and service options. In close cooperation with the clients, customised solu-

tions are developed ranging from single services to integrated services packages.

Core competencies are:

Engineering/Consulting

Plant Construction/Technologies

Maintenance/Services

Dosing and Mixing technology

Bilfinger EMS GmbH offers multidisciplinary services in the area of plant engineering, construction and maintenance.

Over four decades Bilfinger has accumulated extensive know-how in this line of business. This experience is always put to best use for customers and thus serves as the basis for a successful and trustful partnership. The team is known for its dedicated, competent, safety- and quality-conscious approach to service provision.