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we create

Inspections:
An integrated approach
reduces costs

we can

Maintenance:
A self-check points to
potential weaknesses

we care

TURNAROUNDS: EVERY MINUTE COUNTS

How intelligent solutions help
save a lot of time



BILFINGER



TURNAROUNDS

EVERY MINUTE COUNTS

Operators tend to view turnarounds from two very different perspectives: While such processes make the plant fit for the future, they also result in significant revenue losses due to the temporary shutdown of the plant. The objective, therefore, is to ensure downtimes are as short as possible.



Plant operators are required to carry out a turnaround about every two to five years. The process seeks to ensure that the plant remains technically reliable, legally compliant and environmentally compatible. Extensive improvements and maintenance work are conducted during the shutdown, consisting of numerous and sometimes very different sets of tasks. This requires professional project management and meticulous planning well in advance of the actual work: Up to two years of preparation time has to be scheduled so that all of the pieces fall neatly into place during the implementation of the turnaround and no unnecessary time is lost.

2021 is a turnaround year

The Corona pandemic, however, wreaked havoc on the schedules of many plant operators: A lot of the turnarounds scheduled for 2020 were executed with a reduced scope of services or postponed entirely. As a result of this development, a majority of the turnarounds that did not take place last year will now be carried out this year, while others will not be completed until 2022 – in addition to the turnarounds that have already been planned for some time. This will compound the challenges that have existed for years: Complexity (a larger number of tasks in a shorter peri-



od of time) is growing, and the availability of qualified skilled workers who can be deployed flexibly and on a mobile basis is leading to bottlenecks. And because measures to combat the Corona pandemic must remain in effect, upcoming turnarounds have to be planned in greater detail and with greater precision than ever before.

“2021 will definitely be a turnaround year”, says Dennis Lubsch, Bilfinger’s Business Unit Director responsible for turnarounds. “Because of the large number of planned shutdowns, priorities have to be set very carefully and execution plans have to be thoroughly thought out, right down to each individual work step. And of course the time pressure does not mean that there can be compromises when it comes to quality or safety.”

With the Bilfinger Turnaround Concept (BTC), Bilfinger has developed an approach for carrying out all the necessary work in tightly coordinated timeframes. The primary goal is always to keep the duration of the plant shutdown as short as possible without causing interruptions or even accidents. “The modules that make up the BTC are solutions and ideas for the turnaround process that generate significant value added for the plant operator. They are the result of our many years of experience combined with innovative methods that we are constantly developing”, says Lubsch.

Turnarounds are extremely individual

One reason why turnarounds have to be planned and implemented on a tailor-made basis is that conditions vary greatly from plant to plant. There are also various reasons for commissioning a turnaround: In addition

Did you know?
Bilfinger carries out about

100
TURNAROUNDS
a year.

to legal requirements or official inspections, they may also be necessary in the case of plant expansions or conversions, for example. It is therefore important that plant operators define very clear and measurable goals for the turnaround. Only then can the team consisting of plant operator and service provider identify the proper measures.

Another success factor has been to divide the turnaround process into four main phases: Preliminary planning, execution planning, execution and analysis. Analysis in particular is critical because it has a major impact on the planning phase of the next turnaround – and thus on future success. “A turnaround should not be viewed as a one-time, special measure”, says Lubsch. “It must be interpreted as a cycle. Because the next turnaround is always around the corner. That is why it is so important to document the results achieved and the lessons learned, and to draw on these during the next turnaround. This contributes significantly to further reducing downtime and increasing the intervals between turnarounds.”

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Due to the Corona pandemic and the increasing complexity of turnarounds, each step in the planning process must be carefully considered.”

**DENNIS LUBSCH, BUSINESS UNIT DIRECTOR TURNAROUNDS,
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MAINTENANCE SELF-CHECK: FAST AND EASY

How good is our maintenance organization? What are its strengths and weaknesses? And what subject areas need to be included in a maintenance analysis in the first place? With Maintenance Radar, Bilfinger has developed a new tool that addresses these questions – and that is available to all interested parties free of charge on the Internet. Franz Prattes, Global Development Director – Consulting & Products at Bilfinger, explains how the tool is structured and what it can do.

Mr. Prattes, what is Maintenance Radar?

Maintenance Radar is an internet-based tool that forms part of our Bilfinger Maintenance Concept (BMC). It makes it possible for plant operators to perform a self-check and determine in just a few minutes what the strengths and weaknesses of their current maintenance organization are. This enables initial indications of the improvement potentials to the existing status to be identified quickly and without complications.

How does the tool work?

The application is very simple: The plant operator either goes to the relevant website himself or he contacts us and we go through the analysis together. He is asked ten questions that cover all the main aspects of maintenance and to which he gives a self-assessment using a sliding scale. Once he has answered all the questions, he receives a visual presentation of his answers in the form of a spider diagram. This shows where improvements to the current maintenance approach are possible and perhaps even necessary.

What kind of information do you expect from these ten questions?

The range of topics is quite broad: There are questions about HSE performance as well as maintenance costs, planning and scheduling in relation to work orders and the status of digitalization. Evaluations are also carried out on availability, the execution of maintenance activities, maintenance organization and even maintenance software. We have drawn on our decades of expertise in the maintenance of a wide variety of plants in a range of different industries in compiling and formulating these questions.

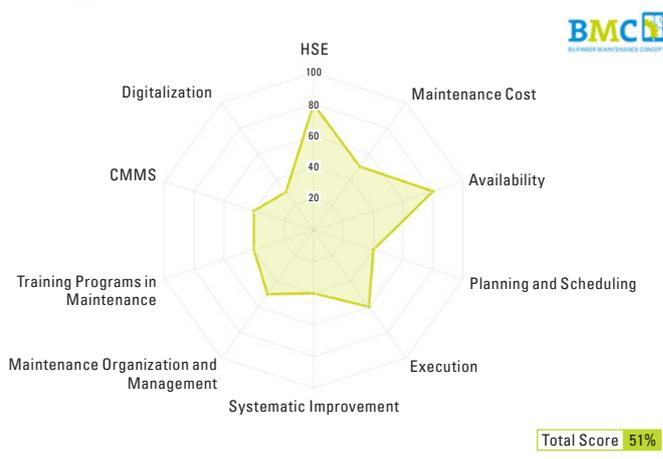




MAINTENANCE RADAR

With Maintenance Radar, plant operators can carry out a self-check of their maintenance performance – and use this information to identify initial optimization potential. The free self-check consists of ten questions and converts the results into a spider diagram.

<https://maintenanceradar.bilfinger.com/>



Who can benefit from the tool?

We have phrased the questions in such a way that the Maintenance Radar is adaptable to all industrial sectors. It is industry-independent and applies to both large and small organizations. In this respect, every plant operator can use this tool to get an indication of where there is potential for improvement in their maintenance activities.

What happens once the questions have been answered?

Although the Maintenance Radar provides some important initial indications of the areas in which current maintenance can be improved, it does not, of course, provide an in-depth analysis. We therefore recommend a more detailed look as the next step – with our Bilfinger Maintenance Analysis (BMA), for example. As part of this analysis, we interview employees and managers from maintenance, procurement, engineering and production and analyze the strengths and weaknesses of the existing maintenance organization along with its processes. On this basis, targets can then be systematically defined and measures to improve the existing organizational structures and processes can be developed and implemented.



We have drawn on our decades of maintenance expertise in compiling and formulating the questions.”

FRANZ PRATTES, GLOBAL DEVELOPMENT DIRECTOR – CONSULTING & PRODUCTS, BILFINGER SE

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INSPECTIONS

FROM INDIVIDUAL SOLUTIONS TO AN INTEGRATED CONCEPT

To ensure that industrial plants can be operated efficiently, safely and with high levels of performance, regular technical inspections are essential in every phase of a plant's life cycle. However, inspections can be expensive – and this is all the more true the more complex the inspection requirements and the more parties are involved.

Regular inspection of structures, pressure systems as well as key components and assemblies are required to ensure the integrity of safety-critical systems and to satisfy legal as well as safety requirements. If defects are found it is essential that these are accurately sized and characterised. The results are used to update a Risk Based Assessment of the asset condition to inform future maintenance strategies and to trigger maintenance or repair orders.

Numerous new inspection methods

In addition to using established non-destructive testing (NDT) methods such as acoustic emission testing, ultrasonic testing or radiography, so-called advanced non-destructive testing (ANDT) methods are becoming increasingly popular. They include, for example, automated corrosion mapping, phased array weld inspection and real-time radiography. The use of drones and flexible rope access solutions also make inspections in hard-to-reach places possible and are both safer and more cost-effective than traditional methods. In addition, the use of semi and fully-automated systems and robots is increasing. The inspection industry is therefore currently undergoing a very dynamic development.

The multitude of different methods, however, also means that service providers are often only focused on certain solutions. This is because the new inspection services in particular require not only the appropriate equipment, but also very specific qualifications, accreditations and competencies. Each method also requires specific site preparations. For the plant operator, this leads to a high level of coordination and administrative effort: Not only does he have to coordinate the different service providers (access, maintenance, inspectors), but he also has to be able to interpret and analyse the inspection results to make decisions quickly and effectively. The result is rising costs for inspection activities.

Everything from a single source

To counteract this, Bilfinger has developed the Bilfinger Inspection Concept (BIC), based on decades of experience of delivering multi-skilled inspection services. It combines various inspection and support services into an efficient solution with just one interface. "With the BIC, we can offer plant operators all necessary inspections along the entire life cycle of a plant from a single source," says Dr. David Hall, who is responsible for inspection services at Bilfinger.

” With BIC, we offer all the necessary inspection services along the entire life cycle of a plant from a single source.”

DR. DAVID HALL, OPERATIONS DIRECTOR – INSPECTION,
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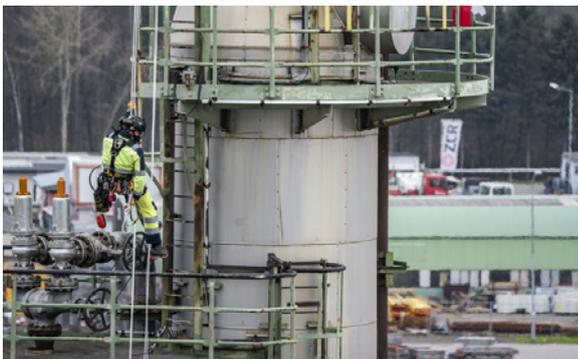
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“We cover a wide range of inspection requirements – from pre-fabrication to routine in-service inspections through to decommissioning and dismantling. The result is a package of fully-integrated inspection services.”

Hall sees the greatest advantages for the customer in the efficiency with which all of the required services can be seamlessly integrated and delivered through a single interface and with access to a network of global experts: “Our approach means that the customer only has one central contact person – and thus a single in-

terface. With our large pool of multi-disciplined, qualified specialists from various fields, we cover almost all requirements. We have the relevant certifications for all relevant inspection activities,” says Hall. “And the best thing is that the BIC is modular, which means that each customer selects only those services from the range that they really need. This allows the customer to optimise not only the performance of their plant, but also their budget for inspections.”

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CHEMISTRY CUI BY ROPE ACCESS

At Shell Chemie Nederland, Bilfinger carried out inspections for corrosion under insulation (CUI) on more than 2,200 pipe bridges as well as non-destructive testing on about 130 pipelines. Instead of using conventional scaffolding, Bilfinger solved these challenges with the help of a rope access team that covered various areas of expertise. The advantage for the client: Halving of the lead times for the preliminary inspection and cost savings of around 900,000 euros (compared to the use of scaffolding).



OFFSHORE USE OF ANDT METHODS

On behalf of Taqa in the UK, Bilfinger provides comprehensive inspection services based on BIC. In particular, advanced non-destructive testing (ANDT) and drone inspection methods are used. Accreditation in accordance with ISO 17020 as well as the deployment of experienced and competent technicians guarantee compliance with the highest quality requirements and safety standards.

SPECIALIST BOTTLENECK

A POOL OF TALENT FOR ANY SITUATION

Skilled specialists are scarce, a fact that also applies to maintenance and conversion measures in industrial plants. Particular challenges present themselves when unexpected developments arise and more personnel than originally planned is suddenly needed.



Spontaneous need for more manpower on work orders in the process industry is not an uncommon occurrence: Unexpected events can happen fast – and often lead to increased scope of work. Especially on larger construction sites or more complex projects, staff requirement, it is often only possible to make a rough estimate in advance. If unplanned challenges arise while work is in progress, additional specialists often have to be called in to ensure that schedules can be met.

But where are you supposed to find such specialists? Employees with the appropriate qualifications are difficult enough to find as it is. Recruiting them on short notice and at the required location adds an entirely new level of difficulty. A further consideration is of course whether these are employees who can fit into existing teams, master occupational safety standards and contribute as much diverse experience as possible – can they do the work expected of them in the shortest amount of time?

Because Bilfinger faces such challenges on a regular basis, the industrial services provider has developed a special service for its customers: “A central module of our Bilfinger Maintenance Concept (BMC) is the Maintenance Center,” says Dag Strømme, Global Development Director at Bilfinger. “The idea is to provide only those employees who are actually needed for the implementation of the contracted services. This results in reduced costs for our customers and the employees who are not currently needed are available for other customers, orders and projects. Most importantly, the solution increases our customers’ flexibility from a local perspective.”

There are special challenges when it comes to larger projects or turnarounds. “For such projects, we have worked out yet another solution with our Resource Network,” says Strømme. “Our Resource Network includes around 3,000 employees. If we need more employees than originally planned, we select the required qualifications using a powerful software program and can thus provide the required number of employees within a very short time. The customer is not the only one who benefits: This allows the employee and the providing unit to also continuously expand their expertise and wealth of experience. The service thus creates a win-win-win situation – for our customers, our employees, and our units.”

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” With the Maintenance Center and our Resource Network, we are uniquely able to resolve even major staff shortages at our customers’ sites.”

DAG STRØMME, GLOBAL DEVELOPMENT DIRECTOR MAINTENANCE & KEY ACCOUNT MANAGEMENT AT BILFINGER

ROPE ACCESS SOLUTIONS

MAINTENANCE AT DIZZYING HEIGHTS

Rope access techniques are becoming increasingly popular. And not without reason: Not only do they allow work to be carried out in hard-to-reach places, they can also eliminate the need to erect scaffolding – often saving time and money in the process.



Bilfinger's industrial climbers at a major German refinery are going above and beyond: At a height of around 30 meters, the rope access technicians are replacing a heating band and the accompanying insulation on some piping. To get to the job site, they abseil down from the top platform of a column at a height of 30 meters and carry out the work while they are secured by the rope.

"With rope access and positioning technology methods, our climbers are able to carry out the maintenance work for our customer in a very time and cost-efficient manner while at the same time complying with the strictest occupational safety standards," says Christian Grauert, Project Manager Elevated Access Technology at Bilfinger arnholdt GmbH. "In fact, rope access is a

very safe way to perform work at such heights. After all, building scaffolding for this particular project would take about 20 times longer than using rope access. The rapid implementation also significantly reduces potential danger to adjacent areas."

Dual qualification necessary

Bilfinger's rope access and positioning technology experts are skilled industrial workers with professional training in trades such as metalworking, fitting, plumbing or insulation. They also have a special qualification as rope access and positioning technicians, or "industrial climbers". Due to increasing customer demand, Bilfinger arnholdt is currently building its own training center for industrial climbers in Herne.

Last year, Bilfinger also acquired Height Specialists, a provider of industrial rope access technology based in Bergschenhoek, the Netherlands. Its employees are all trained rope access experts who deliver various services such as non-destructive testing, insulation, painting and maintenance as well as the dismantling of offshore platforms. They are called upon primarily when other access methods are not safe or possible, or when they have a negative environmental impact. Height Specialists also maintains a training center where International Rope Access Trade Association Level 1, 2 and 3 training is conducted.

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SEEN IN ...

Strong winds loosened a number of panels on a tower at the Shell Pernis Refinery in Rotterdam – Europe's largest. Industrial climbers from Bilfinger Height Specialists use rope access to set up the construction site and take advantage of the opportunity to check the tower's insulation.





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