Mobile Water Services help deliver EPC projects on time

Timely performance, cost saving, quality and safety are essential to all parties involved in a construction project. The construction process is however subject to many variables and unpredictable factors that could impact the successful delivery of a project. Mobile water services are a great option for EPC companies to ensure meeting their client's water requirements safely and within the specified cost and timeframe.

Ensuring contract deadlines without delays.

The key success indicators of a construction project include its completion within the planned budget and schedule, and within the required quality, safety, and environmental limits. However, a project slipping over its planned schedule is a common problem for engineering, procurement and construction (EPC) companies. To the owner, any delay means loss of revenue through non availability of production facilities. Delays can also cause higher overhead costs to the contractor due to a longer work period and additional workforce, as well as higher material costs.

When project costs or schedules exceed their planned targets, client satisfaction is impacted which can have effects on contractors and consultants in terms of relationships, mistrust, litigation, arbitration, cash-flow problems, and diminished support of the company's stakeholders. Completing projects on time is not only an indicator of efficiency, but is also essential to a company's financial health and reputation.

The construction process is subject to many variables and unpredictable factors, which come from many sources. EPC companies notably face a number of challenges for the supply of treated water for the commissioning and start-up of new facilities or even the continuous operation of existing assets during planned maintenance, and the late life management and decommissioning of a plant. These challenges range from water system flushing, condenser cleaning, pipework and tank hydro testing, and steam blows through to cold start-up of assets, risk mitigation on the late delivery and start-up of a permanent water treatment plant, and

Supporting smooth start-ups and testing.

minimization of potential downtime during maintenance.

Engineering companies can benefit from the rental of mobile assets to ensure contract deadlines are achieved safely without delay. This gives them confidence during handover that the quality and quantity of treated water provided by this type of service meets the clients specifications.

Commissioning on time and within budget

Provision of temporary water treatment is well established and Veolia Water Technologies' Mobile Water Services are well placed to meet the requirements of EPC companies. Mobile water solutions are commonly used during the start-up phase of a new power facility for instance. They can support an increased demand for purified water for applications such as boiler cleans, pipework flushes and steam blowing — which remove construction debris, sand, mill scale, etc. — from critical systems, including air-cooled condensers or steam turbine lines. This ensures optimal equipment cleanliness, enabling efficient plant operation for daily power generation. Mobile water solutions can be brought on site to purify the water for this process and then removed when the water demand resumes to normal operating levels following the commissioning activities.

A mobile water treatment plant can also be used if there is a delay in the delivery and start-up of the permanent water treatment plant, which could hold up the project and incur financial penalties. The mobile water treatment plant can be provided to treat the raw water available and produce the desired quality and quantity for any commissioning needs. The mobile plant could also substitute the permanent one to allow the project to go into full-scale operations. This may mitigate any delays in meeting the client's requirements.

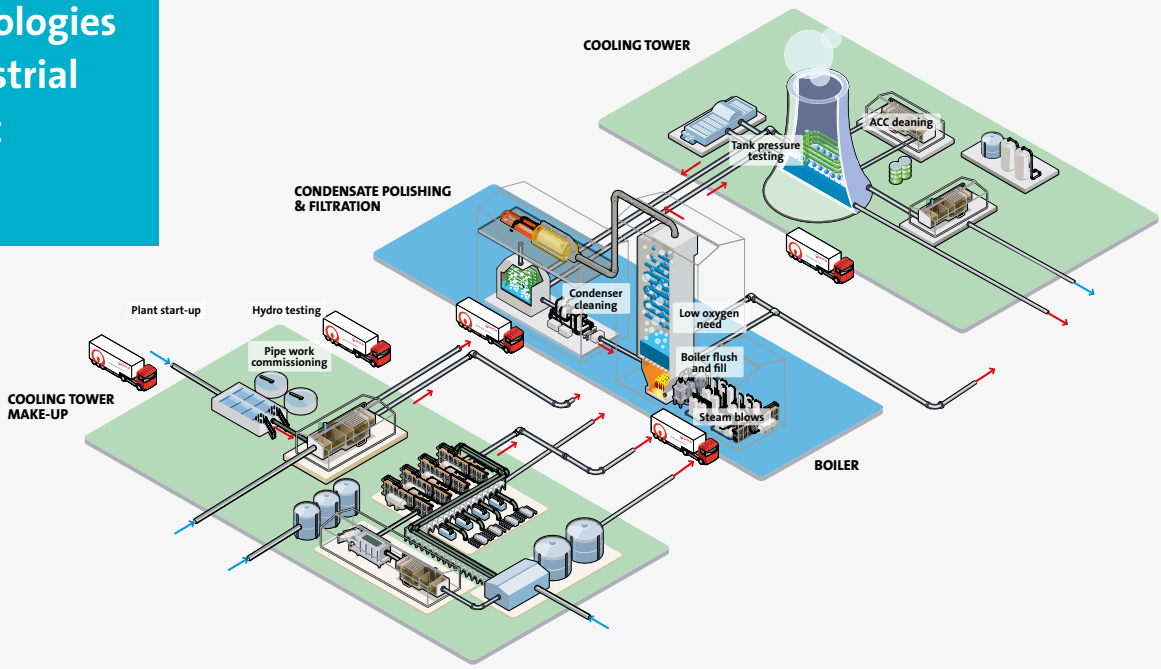
ASSET START-UP

A global leading engineering company in the field of thermal power and environmental technologies was one of the main actor in the construction and commissioning of one of the biggest power plants in Poland, a high-efficiency 500 MW brown coal-fired power unit at a mining and energy complex.

Our Mobile Water Services team was contracted to support the power plant start-up with 100 m^3/h of demineralized water. During a power plant cold start-up, additional volumes of makeup water may be required in excess of the capability of the installed plant. This short term requirement, if assisted by the use of a mobile plant, will speed up the start-up phase and take the client to full scale operation quickly, saving lost hours of production.

Our adaptable solution fulfilled the client's treated water requirements and contractual delivery date.

The latest technologies to cover all industrial water treatment applications.



Planned maintenance and turnarounds

EPC companies also need to plan for maintenance of their clients' existing water systems. Mobile water services can be brought in to cover equipment servicing, ensuring that production or business processes can continue and avoiding costly downtime.

Scheduled turnarounds may involve a total suspension of operational activities. A turnaround that exceeds its timeline or budget can have serious financial consequences, so it is essential that an efficient, reliable water supply is available as needed. In these instances, mobile water services can be brought in to support all maintenance and cleaning activities. They can also bridge a gap for operators with a problematic plant until it can be replaced or repaired, or even to bridge a time period if there are variations in feed water supply or quality, as demonstrated by the experience of the service company of one of the world's leading chemical groups.

The client provides production facilities and utilities for its customers in a chemical park. The individual plants in the park, usually supplied with demineralized water by the client, encountered problems with the raw water filtration which led to considerable operational issues. Our team of mobile water services quickly mobilized assets to produce 200 to 250 m^3/h of treated demineralized water in accordance with VGB standards — a German guideline for feed water, boiler water and steam quality for power and industrial plants — in order to meet the treated water demands required for the chemical park's customers without interruption for a period of three months. This short-term intervention offered a reliable and secure, 24/7 supply of deionized water in continuous operation.

Flexible applications to support start-ups, maintenance and decommissioning projects.

Preventative maintenance and refurbishment of a permanent water treatment plant needs to be carried out more frequently without interrupting the production schedule. A temporary water treatment system may be deployed to either provide the full replacement or partial part of the various processes during this interim need. Typical applications include resin replacement, pressure vessel maintenance, control upgrades, reverse osmosis membrane cleaning or replacement, maintenance on chemical dosing equipment and work on waste treatment plants.

Temporary and flexible water supply during decommissioning activities

There are numerous processes and stages to be completed during a decommissioning project while the water treatment plant is

required to continue to provide treated water throughout the project, as all the stages are completed. The quantity of water required by the site may reduce; the feedwater may change due to other decommissioning activity, causing uncertainty for the process. On-site water treatment plants that have been designed for a certain throughput may not be able to effectively manage the varying flow rates or feed water changes and may also be expensive to maintain.

For planned decommissioning activity, Mobile Water Services provide a reliable, secure and flexible supply of treated water to support the project. It is also possible to use these systems in the case of unforeseen events.

A nuclear power station was being decommissioned in the UK, generation ceased, and the plant had to be defuelled. Originally, during nuclear power generation, the site consumed some 900 m^3/d of demineralized water for steam raising and cooling but, once generation ceased, this reduced to about 26 m^3/d. This meant that the on-site demineralization plant was larger than required and costly to maintain; our client wanted to decommission and de-man it but they still needed a supply of demineralized water.

We provided the demineralized water requirement at the site using a trailer-mounted mobile demineralization plant which provided ion exchange demineralization using similar technology to the station's on-site plant but at a much reduced flow. Instead of in-situ regeneration, when the ion exchange resins became exhausted, the trailer was simply returned to our central regeneration and recycling service center. This meant that there was no requirement for chemicals or for effluent disposal which could have created health and safety issues and interfered with the defuelling work.

TANK FILLING AND LOW OXYGEN NEED

An engineering company received an order for the planning, construction and filling of a district heating storage facility from a German utility company. A 40,000 cubic meter water storage tank was an important part of the overall concept for future district heating in the region. In conjunction with the boiler that had already been put into operation, excess electricity from the network can be used to heat water in the boiler and temporarily store it in the heat store. The water is heated to 115°C and stored in the storage tank before being released with a time delay. With the hot water stored in the heat store, depending on the outside temperature, the supply of over 70,000 district heating customers in the area can be guaranteed for up to eight hours.

However, even at maximum output, the engineering company was not able to completely fill the heat store within the required 6 week period. The engineering company contracted our Mobile Water Services team to perform the first filling of the storage tank with the required capacity. We provided a mobile reverse osmosis asset in double pass to reduce the salinity of the city water by approximately 97%. A mobile degassing unit was added to reduce the undissolved oxygen from the permeate to <20 ppb O_2 along with a mobile pump for additional pressure to pump the treated water into the district heat storage.

The continuous operation of the mobile water treatment units for a period of about six weeks provided the quantity and quality of water required and ensured the completion of the project on time and within the targeted cost framework.

Our teams remotely monitored the trailer, which was changed every month. Our client calculated that this reduced the costs by 50% compared with operating the on-site plant and also allowed early removal of the redundant demineralization plant.

Awareness is key

Mobile water services can bring numerous benefits to EPC companies. It is important that

this thinking is factored into commissioning, maintenance, and decommissioning plants, as it is not uncommon for these processes to demand more water than originally anticipated. As awareness grows, we can expect to see mobile water services being implemented more frequently, supporting planning and helping EPC companies to deliver projects on time and on budget while maintaining resilient and effective water treatment plants in the process.

STEAM BLOW AND CONDENSER CLEANING

One of the world's leading engineering houses built a 44 MW biomass power generation plant on behalf of a major British energy company. Prior to the commissioning of the plant, we received a request for the cleaning of their steam lines using the process of steam blowing and for a closed-loop filtration and polishing system for the flushing of the air cooled condensers (ACC), which had become contaminated with debris during fabrication.

When commissioning a power plant it is essential that the steam lines are free from particulate matter to avoid damage to the steam turbines. This is achieved by conducting steam blows — where steam generated in the boilers is allowed to escape to the atmosphere at high flow rates and velocities — blowing the particulate out of the steam lines. This loss of steam is usually beyond the capabilities of the installed deionizing plant to makeup, so it is common practice to use mobile deionizing units.

The customer also uses ACCs which condense the steam exiting the steam turbines. Due to their delicate structure these needed to be flushed for 24 hours at a high flow rate. To minimize water and energy waste, Veolia proposed a scheme of mobile skid pumps and a filtration unit along with standby units to accommodate swap-outs as required, which would have to be carried out without interrupting the flow through the system.

Using a mobile solution ensured our client a continuous supply of 140 m^3/h, the compliance with stringent health and safety standards under extreme operating conditions, as well as a minimum wastage of water and a significant reduction in cost.