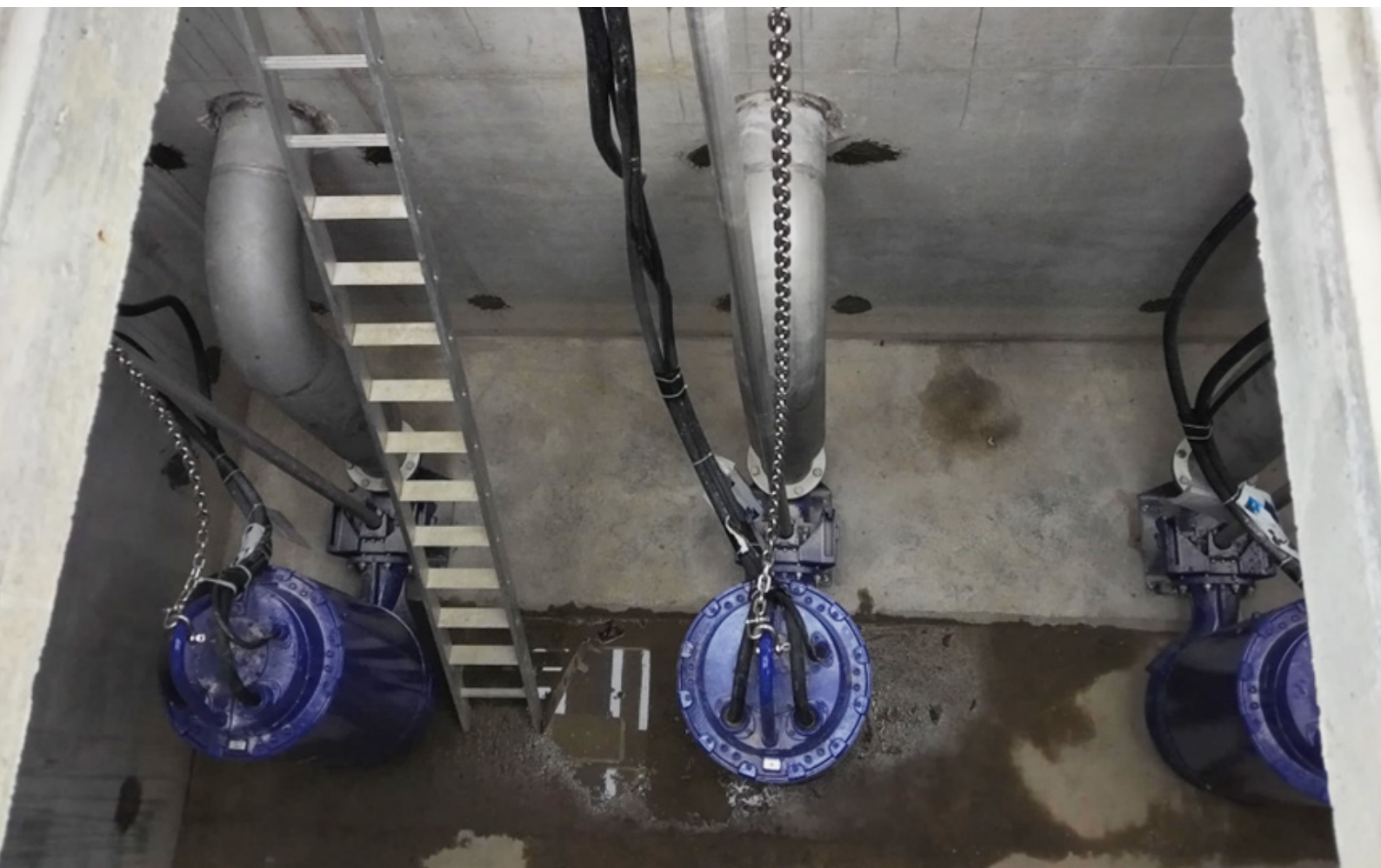


Sulzer's expertise delivers high-head pumping station in Ibiza

Managing wastewater is best kept out of sight and away from local populations, but this is not always possible. In Ibiza, where huge numbers of visitors arrive in the summer, handling all extra wastewater poses a significant challenge. Sulzer was contracted to support the recent construction of a new pumping station providing both design expertise and the supply of 12 high-efficiency pumps.



Ibiza is renowned for its beaches and stunning landscapes, which attract hundreds of thousands of visitors each year. The extra population creates huge volumes of wastewater that need to be treated to ensure the rivers and beaches remain in excellent condition.

Challenging heights

The most recent addition to the sewerage infrastructure on the island was an intermediate pumping station that needed to be located in the heart of a popular tourist area, but thanks to its design, it will not be noticed by all those enjoying the local hospitality. To avoid any unpleasant odors, the wastewater treatment plant is located away from the urban areas, but it is 120 meters above the pumping station, creating a design challenge as an intermediate pumping station was not an option in this case.

Typical wastewater installations use gravity wherever possible to minimize the use of pumps, but they are essential in many situations. A network of pumping stations is used to transfer wastewater to the local treatment works, which are usually positioned close to a water course to accept the treated effluent.

However, the situation in Ibiza is more challenging. In this case, the town's winter population of 160'000 swells to around 450'000 in the summer, requiring a considerable increase in pumping capacity. The designers of the new pumping station also knew that, to achieve the head of 120 m, they would need to arrange several sets of two pumps in series.

Proving capabilities

While creating the basic layout, the designers also needed to source the pumps that would be installed in the station. However, the exact specifications required fine-tuning along with the control philosophy and the precise layout of the pipework. Sulzer's expertise in water management and pump design made the manufacturer a clear favorite to support the project.

Despite the unusual nature of this type of installation, Sulzer was able to successfully provide valuable know-how in similar installations in different countries. The basic design for the pumping station called for 12 pumps, 6 in a wet well with each one connected in series to its pair in the dry well. The outflow from the dry well is gathered in a common collector that is connected to a pressure vessel, which absorbs any pressure spikes, known as a "water hammer" effect, when pumps start and stop operating. This is especially important in high head and long pipe installations.

The pumps in the dry well are responsible for delivering a head of 120 meters



Design expertise

While the initial design was drafted, much of the details were incomplete, especially relating to the pipe diameters, pump connections and control principles. Sulzer was able to contribute extensive knowledge to define all the parameters and complete the design before construction started.

In the meantime, since the pump specifications had been agreed, Sulzer set out to deliver the 12 XFP pumps in line with the build schedule, which was slightly unusual in that they would be assembled in position with the collection manifold before the building was erected around them. Those in the wet well were arranged vertically, while the pumps in the dry well were installed horizontally. All the pumps were equipped with special high-pressure mechanical seals to enable them to operate in both wet and dry locations.

Sulzer also provided design expertise to the project by calculating the dimensions of the taper sections, which are crucial for minimizing vibration and cavitation. Equally important was the support Sulzer supplied for the control system, which needed to carefully start and stop pairs of pumps as the inflow to the wet well increased.

Efficient controls

Operating pumps in series requires a higher level of control to ensure downstream assets operate efficiently and only when the preceding pumps are working. This can be achieved using timers, but this increases the risk of dry running of the top pumps, which must be avoided.

Sulzer suggested a control system that uses pressure sensors to control the drywell pumps in conjunction with variable speed drives, which optimize efficiency and ensure output pressure is maintained. The system also coordinated the operation of the pump pairs to ensure inflow into the wet well was managed effectively.

When the pumping station was commissioned, Sulzer provided support to the operator to ensure all the pumps were correctly set up. Since the project was completed, the pumps have been working without fault for more than a year, ensuring all the wastewater is effectively pumped to the wastewater treatment plant, which is also equipped with Sulzer pumps, mixers, diffusers, Scabas and HST compressors, where it is treated, without impacting the local population. Now, the additional pumping capacity will help to keep the White Isle pristine, even during the busiest holiday season.

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