



## Elevating water distribution in the United Arab Emirates

In the East Coast area, Sheis, in the Emirate of Sharjah, topographical features pose a challenge for the water distribution. Located 450 metres above the level of the main pumping station, the area needs a powerful and efficient booster system to ensure a reliable water supply.

In 2019, the Sharjah Electricity, Water and Gas Authority (SEWA), who is responsible for distributing water to the 1.73 million residents in Sharjah, decided to install a new pipeline from the city Khorfakkan to Sheis, requiring a new booster system to transport water to the elevated area. But they were struggling to create a design that would be able to perform efficiently in the challenging conditions.

With the help of Grundfos and external consultants from Jacobs, SEWA rethought their design and installed Grundfos Hydro MPC Boosters with CRN pumps and a CU controller. The Grundfos design now ensures continuous and efficient water distribution even at the highest point in the Sheis area.

### The challenge

To transport water from the main pumping station to the elevated Sheis area, SEWA was planning to install separate split case pumps at three potable pumping stations along the way and a PLC with limited capabilities.

However, due to the pumps' inability to communicate with each other, ensuring the right flow of water between pumps would require continuous manual synchronisation, which is time consuming and often flawed. Incorrect manual settings could easily lead to a pump transferring too much water, causing the tank at

the next pumping station to flood, or transferring too little water which would lead to an inconsistent water supply at the final pumping station.

With 20 km of piping and a daily transmission of 300,000 gallons, finding a reliable solution for pumping water up the steep incline was essential.

Furthermore, the low flow and high head required in the system made it practically impossible to achieve energy efficiency with the horizontal split case pump installation.

To ensure a consistent and efficient water supply to the Sheis area, the system design had to be revised. To do that, SEWA reached out to Grundfos for consultation as well as to supply the required booster system.





### Grundfos CRN

The CRN pump is an in-line, multi-stage pump available in a wide variety of flow and pressure sizes. Built from high-grade AISI 316 stainless steel, the CRN is perfect for ultra-filtration, reverse osmosis, machine tools (cooling lubricants), distillation systems, swimming baths, oils, alcohols, acids and alkalis, process-water systems and processes handling a broad range of problematic liquids.



### The solution

To handle the challenging elevation, Grundfos advised SEWA to equip each of the three intermediate pumping stations with a water storage tank and Grundfos CRNXL pumps. The vertical multistage pumps are able to handle the high static pressure in the system and ensure energy efficiency. The Hydro MPC Boosters are interconnected through a microprocessor control, the Grundfos CU controller, that monitors and controls the system to ensure smooth and reliable operation.

“The CU controller came with pre-programmed software. All we had to do was enter our parameters, and the control system was up and running. It monitors tank levels and controls all the pumps in our booster system to ensure that there is always water available at the final pumping station while no tanks are flooded,” explains Ahmed Al Mulla, Projects Head, SEWA Khorfakkan.



### The outcome

Since the redesign, SEWA has been reaping the benefits of their new booster system.

“We are really impressed by the efficiency of the Grundfos MPC Boosters and the CRN pumps. They are able to handle the static pressure, which was a challenge for the original design, and we were surprised to see how little pipework was needed to transition from the horizontal split case pumps to the new complete booster skid solution,” Al Mulla explains and continues:

“The CU controller gives us the information and control of our system that we need. We can start and stop pumps at the push of a button, we can monitor tank levels, and the pumps can communicate with each other. That way we can spend our time on other tasks without worrying about whether or not the system is running reliably.”

While the redesign has had many benefits for SEWA, at the end of the day, the most important thing is the benefit that it brings to the consumers in the Sheis area:

“With our new Grundfos booster system, we can offer our customers in the Sheis area a reliable water supply which is our ultimate goal in everything we do.”