IVC SAVES THE DAY FOR KUWAIT's WASTE WATER PUMPING STATION

Unlike in India, The city of Kuwait lets its waste water be carried in underground pipe lines, by gravity, to the city's outskirts some 30-40 km away. And they have deep wells (they call them man holes), 30 feet in dia, along the pipe line, the lines terminating into waste water pumping stations from where, after secondary treatment, the water is pumped to farm yards for irrigation. The last 2 wells before the pumping station are 30 m deep. Each of these wells has 2 Large Penstock, kept normally open. The waste water pumps are synchronised to operate with the inflow of effluent.

One summer morning there was a major blow out at the Mishrif Sewage Pumping Station and none of the waste water pumps would run. Immediately command was issued to close the Penstock in the deep well nearest to the station, the electric actuator atop the Penstock wouldn't budge. They tried the Penstock in the next deep well, it wouldn't work either. The men despatched to operate the Penstock in the well, manually, too failed to close the Penstocks. Mean time, sewer water from Kuwait city kept on coming and flooding the pumping station. They then resorted to throwing sand bags in the well in order to stop flow of waste water into the pumping station, it did stop flow but by then waste water flooding the pumping station had severely damaged costly equipment, so much so that the pumping station had to be closed down until a major overhaul was done.

Part of the overhaul process involved removal and replacement of the Penstocks in the two wells, Replacement of a large hydraulically operated Penstock inside the pumping station, erection and commissioning in the shortest possible time. Our associates in Kuwait interacted with the end user (MPW) and the consultant and gave us the requisite feedback needed for design.

Sluice gates (Penstocks) are seldom used for heads exceeding 15 mwc. Here the heads were 35 mwc, including for the Hydraulic Penstock inside the pump station and a large size 2000 x 2000 mm. Also, operating these (for the well) from ground level, i.e., 30 m above was no mean task either. Using 3D and FE Analysis, we were quickly able to come up with a design that promised 5 times the safety vis-a-vis the tensile strength of cast iron. For good measure, these were spiked with 2% Nickel to yield some corrosion protection.

Soon thereafter these Gates were manufactured at our Nasik plant, tested in the presence of the end user and shipped to Kuwait. Our associates did a fine job of erection and we stood by during first commissioning. All 3 Penstocks have been operating to the client (MPW)'s entire satisfaction since 2012.

A few illustrations: