

Flygt Submersible Pumps Help with Flood Control in Sims Bayou

Working closely together, the client, consultant and distributor pooled their knowledge to bring a challenging project to successful completion

Sims Bayou begins near Missouri City, Texas, and meanders northeast until it reaches Buffalo Bayou. As a result of the Federal Flood Damage Reduction project, the bayou has recently undergone significant flood control improvements. Citizens residing in neighborhoods adjacent to Sims Bayou now have a lower risk of flooding than in the past and are benefiting tremendously from the project.

Scope

The City of Houston required a new lift station to help mitigate flooding in Sims Bayou. Due to large variations in total daily head – a static head of 46 feet but reaching as high as 138 feet – pump selection was an issue. The concern centered on net positive suction head required when one pump was running by itself, especially since the consulting engineer, Klotz Associates, had ruled out the use of variable frequency drives (VFD). Also, the City of Houston preferred to build a “Station in the Round” due to lower construction costs. The consultant proposed a 42-foot diameter and 46-foot deep wet well to accommodate six pumps.

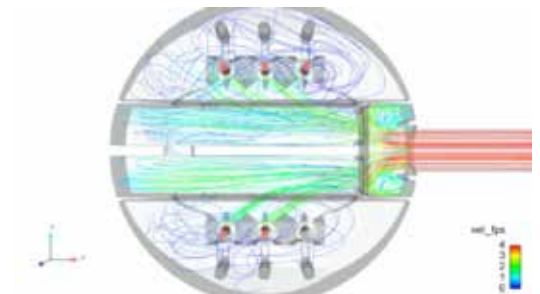
Based on the pumps recommended by Hahn Equipment, a Xylem distributor – six Flygt CP3356, 280-horsepower submersible pumps – Xylem conducted a computational fluid dynamics (CFD) study to analyze potential fluid flow problems at the station.

The CFD study revealed problems with flow distribution at the approach to the proposed pumps, as several of the pumps would suffer from excessive swirl and uneven velocity distribution at the impeller eye.



Construction of “Station in the Round” in Sims Bayou

END USER: City of Houston, TX
CLIENT: Sims Bayou
ORDER DATE: 2014
COMPLETION: 2014



The CFD study confirmed the modifications to improve the hydraulic conditions

What followed was a conference call among the project manager, the consulting engineer and Hahn Equipment to discuss the problems. Suggested modifications to the pumps included enlarged inlet ports, and guide vanes inside the ports and the inlet chamber. These changes would significantly improve the hydraulic conditions and provided an example of how stakeholders working closely together were able to avoid costly future modifications to this project.

Solution

The six CP3356 Flygt pumps were selected over competitive equipment, which actually offered higher horsepower units.

Hahn Equipment convinced the City of Houston that the total horsepower of the six Flygt pumps would be less than five competitive pumps, resulting in a lower cost solution to this pumping challenge.

Able to operate directly in the liquid being pumped, Flygt submersibles do not require special housings or superstructures to support them, considerably reducing construction costs. They are smaller than non-submersible counterparts because the motor and hydraulics are integrated into one compact unit, resulting in smaller pumping stations that are less complex to build. Finally, operating submerged they take up less space, and noise and cooling problems are virtually eliminated.

Result

In the end, the City of Houston, Klotz Associates and Hahn Equipment worked arm-in-arm to deliver a successful pump station to the Sims Bayou Federal Flood Reduction Project in Texas. The Sims Bayou project was designed and constructed in an environmentally responsible manner, and an increasing number of birds and wildlife can already be seen along completed segments of the bayou and at the stormwater detention basins.



New lift station in Houston, TX includes six Flygt CP3356, 280-horsepower submersible pumps



Flygt CP3356, 280-horsepower submersible pump

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