

SECTOR:
WATER

OFFERINGS:
DESIGN APPROVAL STUDIES

TECHNOLOGY:
FLUID DYNAMICS

CFD ANALYSIS OF PUMP SUMP FOR DIFFERENT WATER LEVEL

Our customer is a pump manufacturer and supplier of pump services. For construction of a pump sump the customer is involved in supply and installation of the pump and must guarantee a certain performance. Zeus Numerix is engaged with the customer to perform the CFD analysis of the pump sump to estimate the performance.

CFD studies were performed to estimate the pressure drop and pressure losses occurring in different regions of the sump. The pump sump must be operated for various pump combinations and at different water levels. Simulations are performed for highest water level (HWL) with all pumps active, for lowest water level (LWL) with only one pump active and for medium water level (MWL) with three pumps active. At LWL two cases with each extreme pump being is simulated. Whereas, at MWL two cases are simulated one with three adjacent pumps active and another with alternate pumps active. The analysis showed larger vortex formation at the entrance to a few pumps while operating in particular configuration.

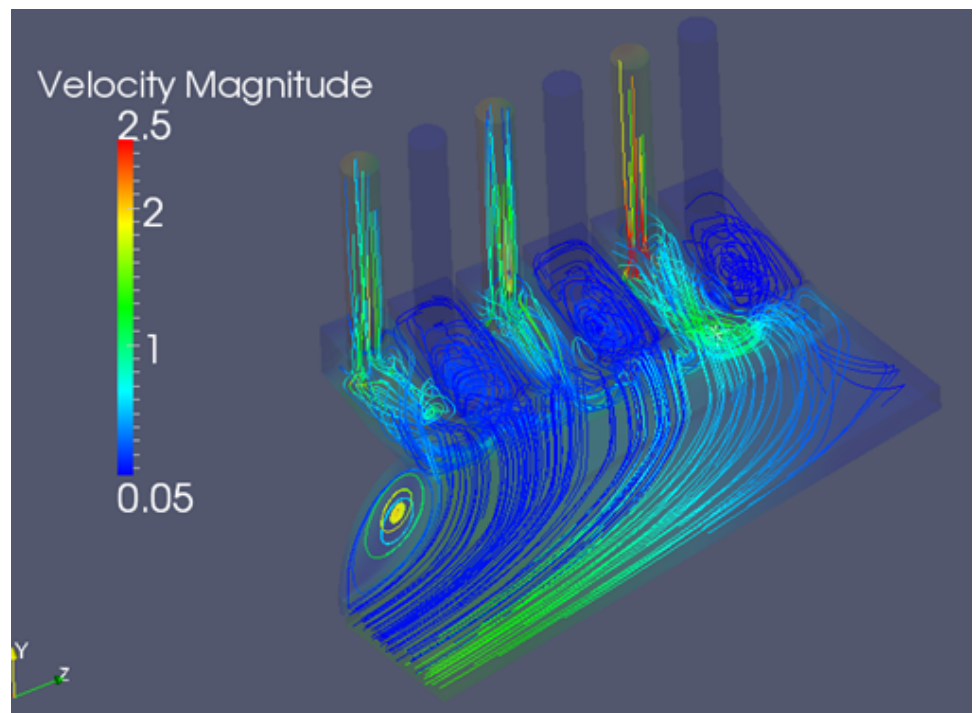
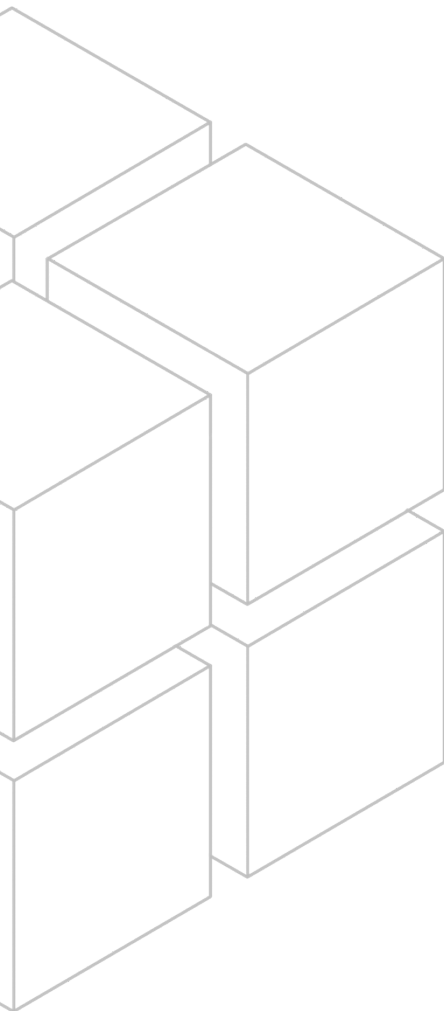


Figure 1: Velocity plot of the pump sump at medium water level

A consolidated report was delivered to the customer with detailed analysis. Based on the results best possible combinations of pump are suggested to the customer for smooth sump operation. The report was used to get clearance from the authorities for pump installation.