

# Case Study

HYDRO AUSTRALIA

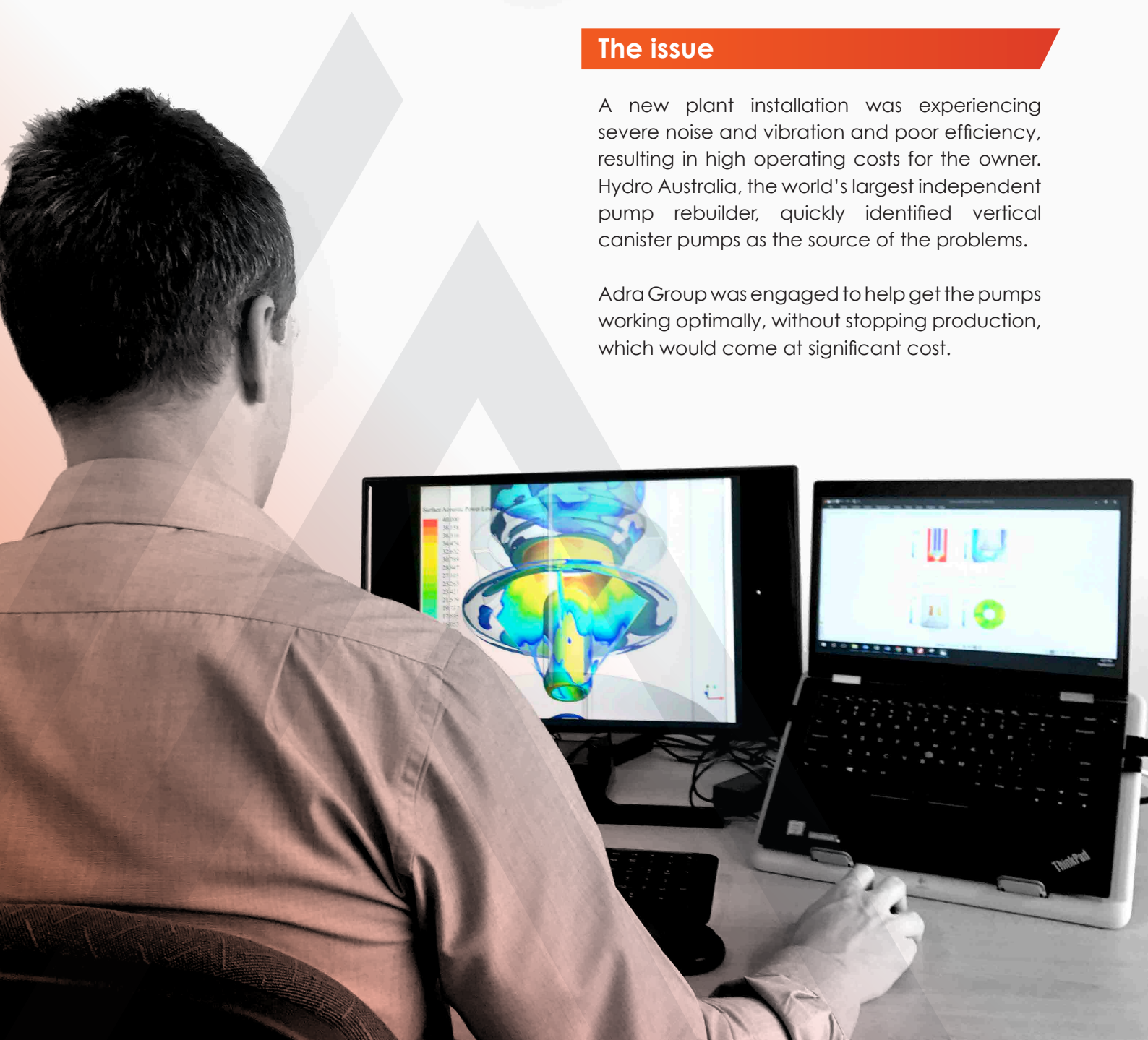


## Fixing Pump System Problems with Computational Fluid Dynamics (CFD)

### The issue

A new plant installation was experiencing severe noise and vibration and poor efficiency, resulting in high operating costs for the owner. Hydro Australia, the world's largest independent pump rebuilder, quickly identified vertical canister pumps as the source of the problems.

Adra Group was engaged to help get the pumps working optimally, without stopping production, which would come at significant cost.



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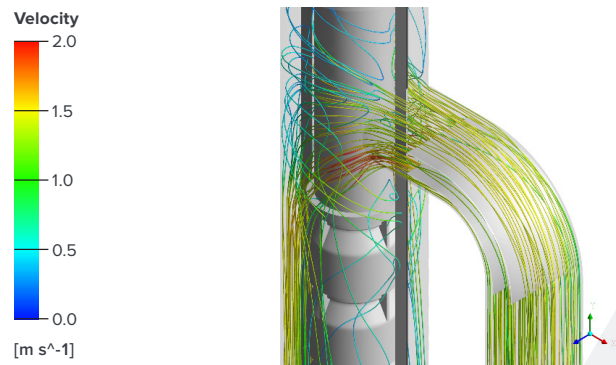
## The solution

### Computational Fluid Dynamics

Adra Group used Computational Fluid Dynamics (CFD) modelling to simulate the conditions and behavior of the pump system. The CFD model provided internal flow information that was impossible to measure on site.

Working closely with Hydro Australia, Adra Group identified the exact source and location of the problem within the pump. This enabled the implementation of modifications to the pump internals to determine the simplest and most economical solution for the client. Changes were verified and presented to the owner.

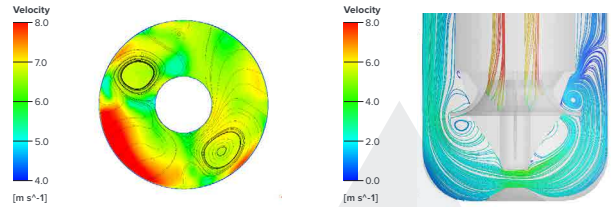
The alternative to this solution was an expensive shutdown over a long duration to modify the pump and piping layout.



3D flow streamlines into the pump canister. CFD modeling provides accurate, quantitative, visual information.

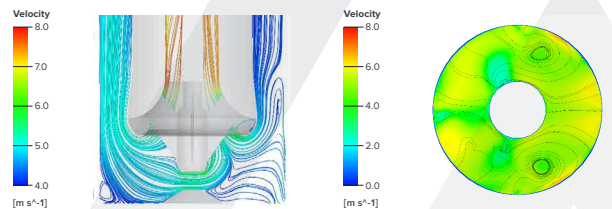
## The result

The CFD modelling and verifications ensured Hydro Australia and Adra were confident they could guarantee a clever practical solution. The plant was shut down to make the modifications, which included the installation of a diffuser at the bell mouth inlet flange. On re-start, the existing noise and efficiency issues were fixed. Production recommenced, the high operating costs were resolved and the plant was running efficiently as promised.



Original design with rounded canister

Installation of a diffuser at the inlet bell mouth provided an even fluid velocity distribution and significantly reduced recirculation and pressure loss



Modified design incorporating diffuser

### Quick facts



0 production hours lost during solution identification and development.



The alternative to this solution was an expensive shutdown over a long duration to enable modifications to the pump and piping layout.



Increased efficiency and a saving of approximately \$50,000 through avoiding modifications to the pump and piping layout.