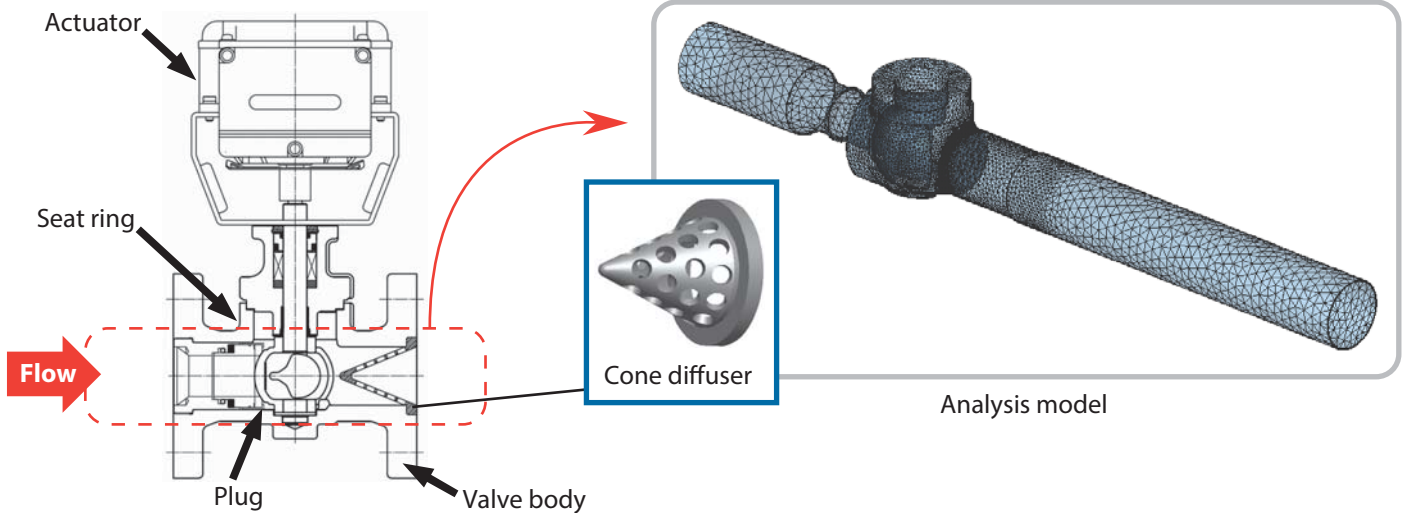


# Development of a Cavitation Resistant Rotary Control Valve

Case Study for Azbil Corporation

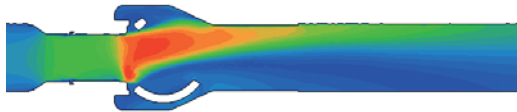
SC/Tetra was used to develop a rotary control valve that has an improved cavitation resistance

## Predicting the Effects of Cone Diffuser by Visualizing the Flow inside Rotary Valve



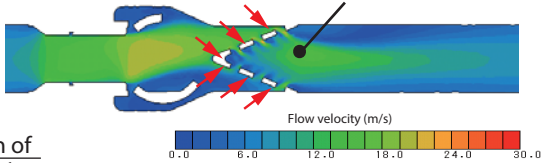
Usual rotary valve

⇒ Valve damage is caused by the cavitation generated due to the rapid pressure drop



Rotary valve with a cone diffuser

Cone restriction and downstream mixing prevent rapid pressure drop



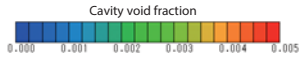
Distribution of velocity contour



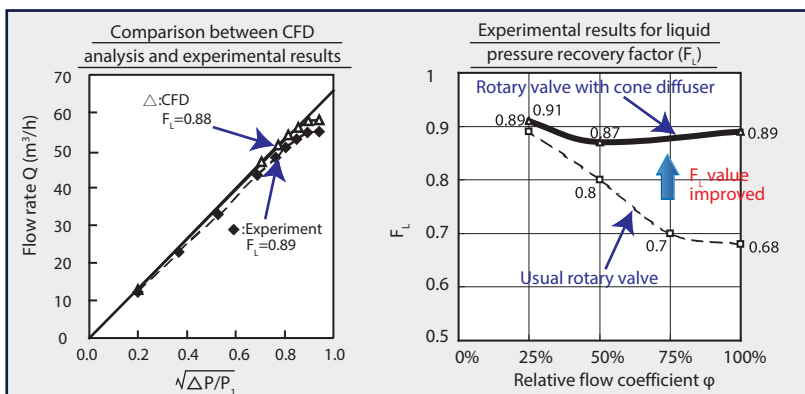
Generation of cavitation is minimized



Distribution of cavity void fraction\*



\*Void fraction is the ratio of vapor volume.



The cone diffuser reduced the cavitation risk and minimized the overall size and weight

## Customer Comments

Using the CFD cavitation model enabled us to achieve the following;

- Improving physical understanding and revalidating the effects by visualizing the flow velocity and void fraction
- Optimizing valve design to minimize cavitation, balance flow capacity, and maximize liquid pressure recovery factor ( $F_L$ )