

Regarding the design review for the new concept control valve completed with Mr. Mark Lobo on November 11, 2014.

The staff at the New Product Development Center has evaluated a new design for an in line flow control valve presented to us by Mr. Mark Lobo. Our team of Jennifer Vinyard, Heather Lewis and Robert Taylor evaluated the design, analysis and valve specification files provided by Mr. Lobo. After completion of the internal design review we met with Mr. Lobo on November 11 to discuss the design and the path forward. The results of design review are:

Valve design concept:

The control valve design concept presented by Mr. Mark Lobo offers a significant improvement over control valve technologies using gate or ball type valve control strategies. The gate and valve type control strategies create significant turbulence in the fluid flow and generate an environment that can lead to cavitation. The turbulence and cavitation in the valve or downstream flow tube lead to erosion and possible failure of the flow or control system. Mr. Lobo's design offers a smooth and continuous transition for the fluid across the pressure drop region of the control mechanism. This smooth transition will minimize induced turbulence and work to eliminate cavitation on the valve or the downstream flow tube. The lower induced turbulence and minimized cavitation will minimize damage to the valve and flow system thereby extending the operating life of all components involved.

Valve analysis:


The NPDC did not run an analysis on the mechanics or motion components of the control valve design. All analysis provided by Mr. Lobo were in line with the approach we would have taken to analyze the valve. All equations and assumptions are well documented and in line with standard analytical procedures. We are in agreement with the design process to date.

Design Concerns:

Our team had one concern with the design of the new valve that is based in the valves ability to completely seal off the flow after an extended run time. It is assumed that particles in the fluid will begin to erode the areas on the valve that serve as a seal for completely cutting off fluid flow. Mr. Lobo has stated that the valve is not intended for use as a flow sealing mechanism. The valve is only designed to control flow volume and not stop flow completely. For use as flow control over a reasonable range the erosion of the valve sealing surfaces will result in the possible need to recalibrate the valve performance after an extended run time although the unit will still function as designed.

Recommendations:

The NPDC is in agreement that the design and fabrication process should move forward for the new control valve product. We have offered to make an introduction to Wilco Machine and Fab as a possible manufacturing partner.



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