U.S. Paper Mill Significantly Reduces Process Variability with Fisher™ Control-Disk™ Valves

RESULTS

- Process Variability Significantly Reduced
  Loop 1: from 8.0% to 3.0%
  Loop 2: from 3.5% to 1.6%

After replacing two troublesome valves with Fisher™ Control-Disk™ valves, poor control was not an issue anymore.

APPLICATION

Vacuum control loops that remove water from pulp stock

CUSTOMER

A paper manufacturer in the U.S.

A paper-producing machine at a U.S. paper manufacturer outputs more than 5,000 feet per minute on a 30-foot-wide roll. It uses a twin wire former to turn pulp stock, which is approximately 98% water, into paper. The former is the first place that water is removed from the pulp stock, using a vacuum control loop on the multi-foil shoes.

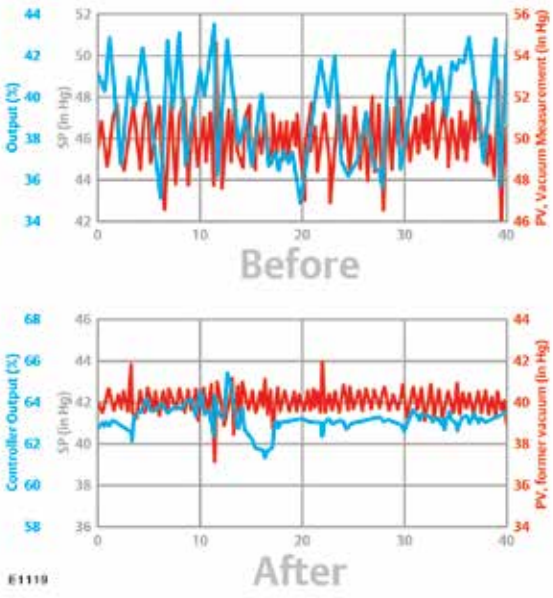
Water removed from the pulp stock at this point has a big effect on the operation of the rest of the paper machine. Poor control in the former can lead to problems with consistency and sheet formation.

CHALLENGE

The two troublesome high-performance butterfly valves were both operating below 20% travel. The valves spent most of their time in manual control after their installation 7 to 8 years prior. Plant personnel made unsuccessful attempts at placing these loops in automatic control. High-performance butterfly valves have an inherent flow characteristic that is linear.With an inherent linear characteristic, valves commonly have a narrow travel band over which they exhibit an optimum installed process gain. Typically, this range is 30 to 50 percent of total travel. This band is called the control range. Outside the ideal range, process gains become very high or very low, and high process riability results.

Installed process gains were greater than 4 (the EnTech desirable range is 0.5 to 2). Process variability in the loops were 3.5% and 8%. The vacuum loop was manually adjusted. The valves displayed excessive backlash, as illustrated in the graph.

Piping space is too limited to allow changing to segmented ball valves. Swaging down to a smaller valve size would be very expensive and time consuming.



SOLUTION

Fisher Control-Disk valves replaced the two troublesome valves, and operators left the loops in manual to observe the valves' behavior. Then, operators put loops in automatic and saw good control immediately. One valve was operating at 30% open, the other at 60% open.

Variability was significantly reduced: from 8.0% to 3.0% in one loop and from 3.5% to 1.6% in the other. Variability was further reduced after the loops were tuned.

Vacuum control loops that were once troublesome were now not an issue.

Tracking of valve input signal and valve output (vacuum) before and after installation of Control-Disk valves shows dramatic reduction in process variability.

RESOURCES

Product Webpage: Whisper Trim III
https://www.emerson.com/en-us/catalog/fisher-whisper-trim-iii

http://www.Facebook.com/FisherValves
http://www.YouTube.com/user/FisherControlValve
http://www.Twitter.com/FisherValves
http://www.LinkedIn.com/groups/Fisher-3941826

Emerson Automation Solutions
Marshalltown, Iowa 50158 USA
Sorocaba, 18087 Brazil
Cernay, 68700 France
Dubai, United Arab Emirates
Singapore 128461 Singapore

FISHER™ For more information:
www.Fisher.com

EMERSON™

D351618X012 / Sept 2018