

HENRI offers best solution for pulp stock feed control

Issues

In paper production process, wide ranges of parameters have to be controlled in order to achieve excellent paper quality with superb productivity. These parameters include basis weight, caliper, brightness, opacity and moisture to name a few. Many types of process measurement instruments are installed to measure process variables that relate to these parameters.

One of the most critical parameters among these is basis weight of paper. Basis weight is designated density of paper expressed in terms of the mass of given dimension and sheet counts. Each type of paper product has its own basis weight, therefore, as long as the same type of paper product is being produced, the basis weight has to be even. When basis weight is not even while producing the same paper product, the quality will be out of tolerance and the final product of the paper will be wasted. This not only degrades the quality of the products, but also worsens the productivity of the process.

The key factor for keeping the basis weight even is to control the amount of pulp stock flowing into the head box. Conventional control method was to measure the basis weight and give feedback to control the valve on the pulp stock flow (see Fig.1). The problem of this control method was, however, that it took time to have feedback of basis weight change and adjust the valve position accordingly. As a result the pulp feed to the head box would become unstable before the valve position has been adjusted.

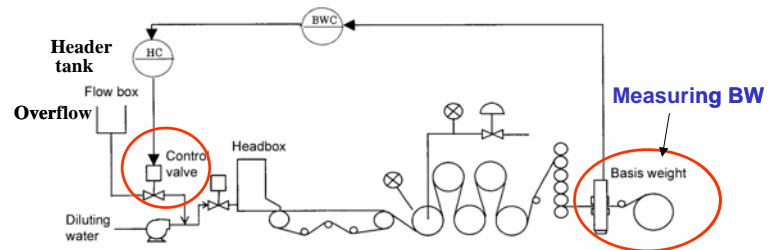


Fig.1

To enable more timely control, it is necessary to measure the pulp stock flow directly instead of using basis weight value as feedback (Fig.2). What makes this difficult is that the pulp stock contains high percentage of pulp slurry. Magnetic flowmeter is the only option for pulp slurry measurement because it has no obstacles inside the flow tube thus there is no concern for clogging. However, the high percentage of pulp slurry causes output fluctuation of magnetic flowmeters due to the high-level slurry noise. Superior noise immunity is the key to achieve optimum process control in this application.

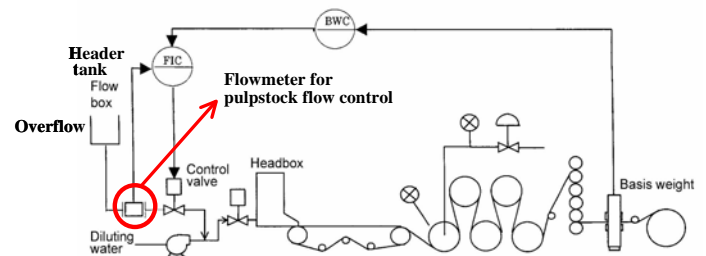


Fig.2

Solutions

Yamatake has developed a magnetic flowmeter that is dedicated to this pulp slurry application, called HENRI (High-Energy-Noise-Resistant Instrument). Conventional magnetic flowmeters installed in this application had significant output fluctuation caused by pulp slurry noise that occurs when fibers hit the electrodes. HENRI solved this problem by applying high frequency excitation technology, which drastically eliminates the influence of pulp slurry noise. This technology is based on the analysis of noise frequency spectrum. According to the analysis, pulp slurry noise level gets higher when frequency is lower (Fig.3); therefore, by employing higher excitation frequency, HENRI can eliminate the lower frequency noise from the higher frequency flow rate signal. As a result, HENRI achieved significantly more stable measurement when compared to conventional magnetic flowmeters in pulp stock feed process. (Fig.4)

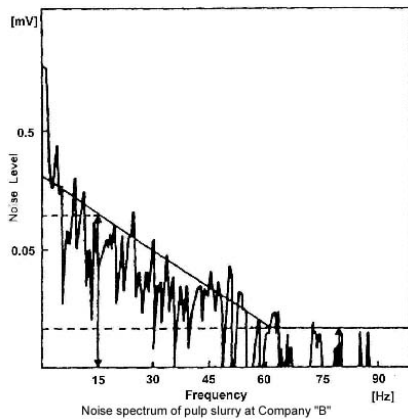


Fig.3

A major paper making company in Japan tested HENRI to see how it performed in their pulp stock feed process, comparing it with their existing conventional magnetic flowmeters from another supplier. This testing demonstrated the improved performance of HENRI compared to conventional magnetic flowmeters, leading the customer to state, "The old magnetic flowmeters never did give us a decent basis weight valve bump. HENRI will allow

us some significant improvements to our control tuning." This customer has now adopted HENRI and they are counting on its stable output for pulp stock feed control.

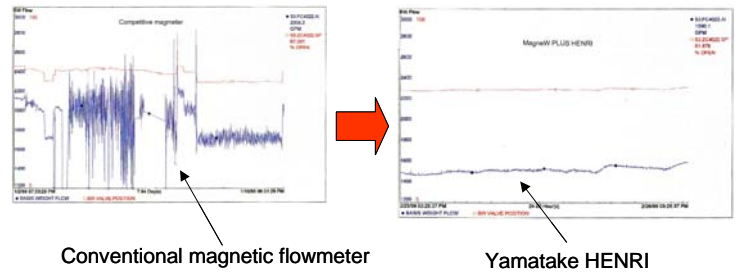


Fig.4

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