control station

CUSTOMER CHALLENGES: Improving Mill Scale Feeder Performance

Feed Your Way to Consistent Product Quality!

Modeling the Dynamics of Highly Oscillatory Processes:

Typically Mill Feeders aren't the first thing that come to mind when looking for performance improvements at a cement mill, especially at one with annual capacity of four million tons. But it was one area where engineers at a leading cement manufacturer looked when digging deep for productivity enhancements. The Feeders are located at the start of the mill's production process – usually a good place to start.

The mill was already running well. Even so, engineers realized that it could operate better. They understood that every improvement would help the company to maintain its leadership position in the highly competitive Basic Materials market. They made it their responsibility to uncover even "little" improvements that would improve the mill's bottom-line performance.

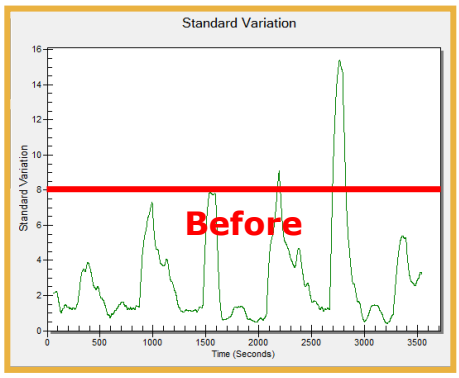
"When the feeders respond more quickly to disturbances, variation in the process is reduced. That allows us to maintain quality and to achieve a more consistent feed rate. In the end, that improves the mill's productivity and our financial performance."

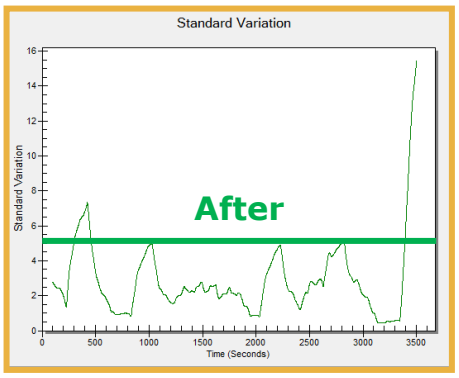
Senior Process Engineer

When a Picture Tells a Thousand Words

Feeders control the amount of raw material that is transported from the Preheater Tower to the Kiln. Maintaining a consistent load during this part of the process assures that the raw material is properly "pre-heated" and that energy costs are minimized. What's more, a consistent load enables production engineers to maximize output by eliminating disruptions to the process. If not regularly tuned, however, Feeders lose their ability to effectively respond to changes in the amount of raw material that is introduced. Since most tuning software fails in highly noisy environments, keeping the Feeders calibrated was a manual process.

Before and After images of the Mill Feeder's performance are shown above. On the left, the process showcases steep peaks in Standard Variation and a pre-tuning Variance of 0.077. On the right is the process' performance after it was tuned using Control Station's LOOP-PRO.





DEFINITION: Standard Variation is a measure of how far the process deviates from its Set Point over a given period of time.

The peaks were muted considerably and Variance was reduced by 62% to 0.030, enabling improved Set Point tracking. Fluctuations in load were reduced which allowed the mill to maintain a more consistent production rate. Another benefit of tuning this loop – the final control element was given a much needed break and its life was extended considerably. As with most things, little fixes can add up.

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