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BELOW THE RADAR

Factors that Steal Tons, Increase Costs and Prevent Change

“How Fast”, “How Much”, “How Long”, or “Where” – Equipment Operators are Virtual Control Systems in Surface Mining

Picture yourself inside a prep plant, watching and listening to coal being crushed, washed, separated and conveyed to the loadout area for shipment. You take a quick look through the plant, but only see one or two people walking through the aisles, checking gauges and valves attached to major components. In some respects, the plant seems to be running all by itself, processing coal without the aid of human hands. Finally, you turn the corner and find the control room, where two operators monitor several real-time control charts and camera shots. In a prep plant, people “produce” coal by monitoring processes from the outside looking in, relying on PLCs linked to computers to provide data on process behavior and give operators early warnings of out-of-control conditions.

Conversely in surface mining, almost *nothing moves without people getting inside each piece of equipment*. At the beginning of each shift, operators climb inside draglines, loaders, dozers, trucks and drills. They start the engines and begin drilling, digging or hauling, moving dirt or coal to its desired destination. The closest thing to a control room is dispatch, which primarily directs trucks to specific loading machines. Satellite systems on board help capture delays and other data, but most process control in surface mining (i.e., the best position for loading, overloads and underloads, good road conditions, adequate air in tires, use of a bucket, haul speed, placement of overburden, etc.) ultimately occurs real-time as operators evaluate “how fast”, “how much”, “how long”, or “where” with each movement of their machines. Productivity, coal recovery, cost, and equipment life are all impacted by the quality of their judgment calls. Equipment operators are virtual control systems for mining operations.

Every prep plant control system contains control limits (minimums, maximums, optimums) for many variables. These limits indicate acceptable levels of speed, weight, reagents, etc. Staying within the limits is important because it prevents equipment damage, minimizes cost, optimizes production and creates an opportunity for consistent performance over time. When these limits are exceeded, corrective action must be taken. Without these limits, there would be no standard to ensure consistent and predictable performance.

One of the greatest challenges in surface mining is imparting a standard set of control limits to equipment operators and then depending on them to choose to restrict or direct equipment usage based on those standards. If a set of standards does not formally exist, then the chance of operators behaving consistently with equipment is probably zero. If standards do exist but have not been communicated to the operators, they will be topics for discussion at the morning meeting due to unplanned events that result when a standard was not met (equipment damage when a bucket was used improperly or an early tire failure due to a rock cut) or when production fell short of expectations....again.

If surface mines are serious about standardizing performance, equipment operators must know their standards in order to meet expectations with their equipment. When management communicates their standards along with their actual performance, operators understand their performance gap. The communication strategy that goes along with the data communication is key to success because people choose each day whether to “get one more load before quitting time or leave now”, or whether to “drive around a rock in the road or run over it”. The way the message is delivered can greatly influence that choice, and that choice is worth a lot! Communicating data with expected levels of performance helps create a virtual control system capable of delivering huge benefits for future performance.

Here's the thought for July:

In the end, it's all about meeting expectations.
Strategic information sharing is worth its weight in gold in achieving your goals.

Kay Sever implements improvement programs for mining and downstream processing facilities. Her approach balances commonly used tools and methods with a focus on value creation and the “people side of improvement”. Kay works with every organizational level and department to find the highest dollar opportunities and remove barriers that prevent sustainable change. She helps management teams lead improvement and better execute the budget, capital approvals, incentive plans, communications, etc. See MiningOpportunity.com for details on her services and contact information. Look for the mining edition of her first book “Building An Opportunity Culture – Addressing the Barriers That Steal Profits and Prevent Sustainable Change”, available on her website under Products/Books.