

THE PORTABLE PLANT OF THE FUTURE

by Paul Smith



Don Brock, the late Astec founder and former CEO who was one of my mentors, used to challenge his employees to “design a crushing plant that you can’t see or hear.”

At the time, many of us chuckled at the thought. Now, looking back, I believe he was really trying to simplify a vision for our future innovation.

First, let’s examine what’s undesirable about quarry equipment in terms of what can be seen. Let’s start with the obvious: Of course, there is the jobsite itself, the heavy truck traffic, dust emissions and more. But knowing my mentor, I’m sure he intended for us to look beyond the obvious.

He wouldn’t want our industry burdened with the public “seeing” people getting hurt on our equipment, our customers incurring unnecessary wasteful spending in their operations and inflating material prices, producing excess materials of which we have little or no use for and, thus, creating new mountain ranges of stockpiles, and so forth.

Next, let’s examine what’s desirable in terms of what can be heard. Putting the obvious variable of “noise pollution” aside, what else might we consider? We obviously don’t want to hear “silence” in terms of the equipment not running due to mechanical failure. Nor do we want to hear our products are out of spec, or that they do not meet quality expectations.

Of course, everyone is best served if our activities don’t entice the environmental lobby and neighbors prevent us from doing our jobs by holding public hearings.

THE NEXT EQUIPMENT

Based on these factors and in conjunction with adopting a current “lean” mindset, I believe we can develop a product definition that looks something like this:

- Efficient dust collection/suppression systems that do not rely on external water sources.
- Equipment designed with intuitive, simple and reliable safety features and interlocks throughout that will immediately shut down or take corrective measures to prevent human injury, as well as equipment failures.

- Refined guarding designs that will all but eliminate the opportunity to prevent anyone from getting anywhere near moving parts or materials while the plant is operating.
- Process automation to optimize system capacity, desired gradation yields and minimized production of undesirable materials.
- Active noise control and/or noise-suppression systems.
- Transition-point design and material containment will continue to improve to reduce the need for workers to manually clean up around and underneath machinery.
- We can also expect our plants to be designed to better accommodate routine service requirements to perform simple tasks such as changing liners, screen media and so forth.
- Manufacturers will continue to take advantage of advanced materials for everything from structural steel to wear liners. Undoubtedly, they will look for ways to reduce weight while increasing strength and extending fatigue and wear properties. Look for nano technology to be the big breakthrough.

Obviously, there are many products on the market that incorporate these characteristics. One area we as aggregate producers can start to look at for some ideas is the mining industry.

For example, while typically not held to the same gradation and specification requirements that aggregate producers are, sophisticated miners have figured out how to operate fully-automated systems with minimal downtime other than scheduled maintenance intervals. Their systems are generally fully enclosed, making it easier to collect dust and suppress noise, as well as make their activities less obvious to communities.

Still, I think we will need to continue to raise the bar. So where do we go from here?

CUTTING-EDGE TECHNOLOGIES

While I don’t think we are going to see a sonic wave crusher encapsulated by image-reflecting panels anytime soon, I do envision some cutting-edge technologies coming within the next few decades.

For example, automation technology will continue to evolve. The use of optic and volumetric scales and sensors will provide real-time gradation measurements to provide the data sources needed to auto-adjust our machinery immediately to prevent unnecessary waste.

As safety continues to be a primary issue, look for processing technology to strive to eliminate people from the plant during production altogether.

To maximize profits and potentially operate during non-peak hours, expect plants to operate in true “lights-out” fashion without the need for a production crew to operate them. Such highly automated systems will operate at optimum levels to absorb costs.

Also, more processing plants will be enclosed indoors to suppress noise and dust. Dust collection technology continues to advance rapidly, so watch for bag house technology to transform how we keep the air clean around jobsites.

In addition, noise-cancellation-amplification systems could conceivably mitigate noise pollution. The programmable logic controller will take on a greater role auto-adjusting everything from loads in the crushing chamber to gap settings to crusher speeds.

Expect multi-frequency screening and on-the-fly adjustment of screening variables to drive improved screening efficiency, too. We will measure screening efficiency and auto-correct for it.

The desire of communities to push the quarries further away will also result in the increased use of mass transit systems to haul larger volumes of material greater distances. Look for rail and marine transport to make a big comeback, meaning quarries will process and handle material from the blast face all the way to the rail spur or the barge.

As for the science-fiction-oriented reader, where else might we go? Will the sonic wave crusher ever become a reality? Will reflective imaging optics ever disguise the jobsite and hide us from the public?

I don't know if we'll ever achieve Dr. Brock's dream, but he certainly provided the vision for us.