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SYSTEM PROCESSING –
UNDERSTANDING YOUR OPTIONS

by Paul Smith

In today's world there is no reason the consumer should be ill-informed when making decisions on efficient processing. Most of the world's knowledge is available just a few key strokes away on the world-wide web. Still, there is much debate over the various processes available to produce aggregate construction material. Generally speaking, the arguments used to promote each process are often reflective of the supplier's motives. For example, if a manufacturing company's primary product line consists of track-mounted crushing & screening machinery, it is obvious that the company will present a compelling argument as to why track machines provide advantages over other processes. The same can be true with companies who specialize in engineered stationary systems. Don't be fooled. The reality is that the same crushers and screens can be "packaged" in a variety of mobile and stationary configurations – each providing their own advantages depending on the wants and needs of the business. The smart producer will transcend the biased arguments in an unbiased technical analysis and choose when to deploy a mobile or stationary system, and when not to.

STATIONARY PROCESSING

Some basic variables should drive decisions on the type of system to be installed. Will the plant be permanently fixed or require occasional repositioning within the jobsite? Or is it a possibility that the plant will be disassembled after a fashion and relocated to another facility? There are some different styles of stationary systems available today:

PERMANENT STATIONARY

When the plan is to install a permanent system that will not be removed until the quarry runs dry or the equipment falters, a permanent system is the usual selection. Hoppers are designed to accommodate the loading fleet and cycle times, crushers and screens can be matched to perfectly suit the material characteristics and productivity requirements, etc. If designed and maintained properly, the payoff should be the highest possible level of uptime, production and efficiency as compared to any other style of plant.The trade-offs are not insignificant. The time to engineer, permit and install stationary systems are often extensive, and a larger workforce is often required to operate and maintain such plants, which contributes to the overhead burden. Furthermore, the paradigm has shifted in that with rapidly changing markets and increased competitive pressure, today's producers need to be nimbler as compared to yesteryear. Permanent, fixed plants by design do not lend themselves to adjusting for capacity variances, new product specifications and so forth. If a new style of machinery will need to be installed at a later date – such as a larger screen – it can be very difficult and cumbersome to modify the stationary structure to accommodate the new machine. Accordingly, a long business horizon is needed.

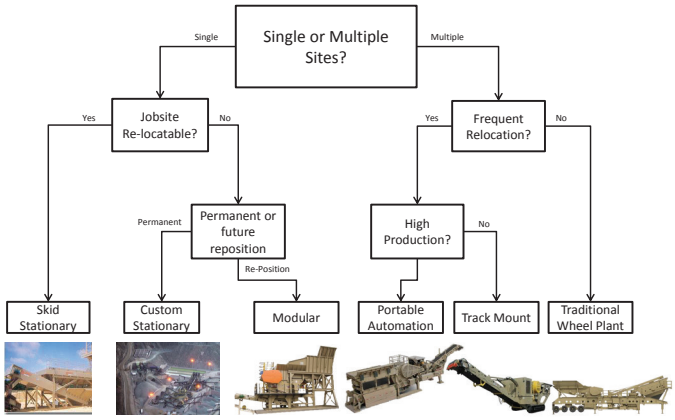
SKID/MODULAR STATIONARY

As the name implies, these systems are stationary structures but are on "skids," thus are designed to be towed around the jobsite for re-positioning. The skid frame is designed to support the machinery thus the cost and time to install permanent concrete foundations is eliminated. They can also typically be disassembled relatively easily (compared to a fixed plant) for relocation to another location. In addition, skid plants typically take less time to install - which allows the plant to start generating revenues quicker. Finally, pre-engineered skid plants will also usually cost less as compared to more elaborate, engineered stationary and portable systems. However, skid/modular plants are also typically generally simplistic in design in terms of controls and are limited in terms of the size of crusher, hopper, etc. (i.e. production) that they can accommodate.

MOBILE PROCESSING

If the need is to service multiple locations, then the clear choice is a mobile system. The only remaining question is whether the machinery should be tracked or wheeled – and to what degree the equipment needs to be "mobile". This is based on an analysis of the producer's production requirements at each location. As any producer knows, "production" is the economic sponge that absorbs all of the costs of operating any plant. As it relates to mobile machinery, the highest cost in the operation comes in the form of lost production between moves and set-up. The longer the plant is not generating revenues between moves and set-up the more it

Aggregate System Selection Process



is "costing" the operation. A portable plant that is not operating is still incurring indirect spending expenses in the form of the maintenance crew, trucking, depreciation (if financed) and so forth. Additionally, the indirect cost to move and always be absorbed…therefore, the longer the production run in any given set-up, the lower the cost-per-ton will be because those fixed costs are spread out. Therefore, for portable producers, the more they are able to reduce downtime and accelerate the set-up process, the more opportunity they will have to increase revenues and profits.

WHEEL PLANTS

Portable or "wheeled" plants are towed behind tractor trailers before being positioned and cribbed into place at the jobsite. They are typically electric (although diesel plants are used as well) and connected with transfer conveyors. They generally require more loads to relocate and more time to set-up versus a comparable track system, therefore they incur higher fixed costs. As such, producers needing to relocate frequently are best-served to install features that will simplify set-up and teardown. For example, such plants are often fitted with hydraulic stabilizers and folding hopper walls. In addition to reducing the down-time, these devices can also reduce the human interface for a safer working environment. Because there is not the added weight & height being consumed by a track carrier or the transport trailer, wheel plants provide the opportunity to mount larger, higher capacity crushers and screens which in turn provide more capacity. If the need is to process high volumes of material as rapidly as possible in multiple locations, portable wheel plants tend to be most commonly used as once fixed costs are absorbed, the added production volume will quickly drive down the variable cost-per-ton.

TRACK PLANTS

The benefits of track machines are obvious:

- They are quickly (re-)positioned and operational in minutes. This is a real asset for relocating within a jobsite, following a linear project, etc.
- Are designed to be more user-friendly and incorporate the "best practices" of processing aggregates into the machinery. This enables operators with little processing experience to have a chance at being successful where setting up traditional plants connected with transfer/ feed conveyors, etc. requires some level of tribal knowledge.
- Mobile plants feed one another with clean transitions, eliminating transfer conveyors. They do not require a large operating footprint – perfect for tight job sites.
- Self-contained power units allow them to work in remote regions regardless of infrastructure.

While the above benefits are valuable for the right producer, there are many suppliers of mobile track machines in the market today who are very savvy at selling them. The result is that many operators acquire these machines that do not fully benefit from the capabilities. For example, transport constraints make them even more difficult to service than portable wheel plants, and the engines demand attention. As a general rule of thumb, diesel/hydraulic systems provide 5-10 percent less uptime than portable equipment. Production of track plants is constrained by components that are sized to facilitate mobility. Of course, track plants often incur a higher investment than wheeled plants and they are also designed to be moved within transportation restrictions. As such, track plants are typically more compact and difficult to maintain. If the above still does not provide a clear decision, economics should be weighed. The deciding factors are:

1. Absorption of the indirect burden costs
2. The variable cost/ton.