

Plant Productivity Increase

Re: Increasing plant throughput using little to no dollars.

A client contacted APM, LLC to help get the throughput up at their sand and gravel operation. The client continued to struggle getting the throughput above 250 TPOH. When I first got to the site I met with the Plant manager, Area manager and the Forman. The first question I asked was if they ever heard of the DMAIC process. The look on their faces told me NO. I believe I stated that within the next few weeks they will have a good knowledge of what the DMAIC system consists of and how they can use it in all their processes.

After a couple weeks of observing, measuring, and analyzing the plants equipment and the processes they were using, we were able to get the plant to produce just over 350 TPOH. With no more than \$2,000 in parts and less than 20 manhours this was achieved. General SOPs were discussed with the team and were then put in place. At first the team was skeptical of what the SOP's would do for them. "More paperwork" After teaching and working with the team during the next several weeks they began to trust and listen to what was being introduced to them. Not more paperwork, only Standard Operating Procedures that Help get the plant where it needs to be. Several of the team members had over 20 years working at this sand and gravel location. They continued to say this plant can't do any more than it is doing today, we have tried and tried, with no luck at all. They all said they are tired of not accomplishing what the upper management was asking of them. The upper management always said, "The plant was designed to do 350 TPOH." "Why are you not hitting the goal?"

Below is a snapshot of the primary belt scale after working with the crew for several weeks.



So, using the DMAIC system approach, this is how we looked at the system. Define; we defined the problem of not being able to achieve the designed TPOH. Measure; we measured some key indicators like belt scales, load counts and equipment capacities. Analyze; we analyzed the information that we gathered over several weeks, that helped us focus on what were the bottlenecks within the process. Improve; we improved the process by removing those bottlenecks. One of those bottlenecks was a stacking conveyor that would slow down if there was too much material on it. (We increased the belt speed to just over 400 fpm) it was a 30" cleated/chevron belt that was handling wet processed sand. This was only one of the bottlenecks that we mitigated. Water within the process was another (GPM and Pressures). We directed the water to the places that needed water within the process. Cycle times at the feed process was one of the other critical process changes we put in place. Control; We put the SOPs in place that insures that what was put in place stays in place. The SOPs we standardized to fit their locations needs. I left the plant manager and the area manager with an action list and recommendations of what needs to occur before the next visit.

When I returned to do some follow up work, one of the crew members came up to me to say thank you for helping us get the plant to its designed TPOH. It has been nice not having to work so many hours, and that I have been able to spend time with my family. I feel much more positive about working here again. I said, then let's go see if we can get anymore throughput out of this plant. By going through the DMAIC system again with the Plant manager, foreman and the crew, we were able to get another 24 TPOH out of the plant that was designed for 350 TPOH and ultimately achieved 374 TPOH.



In the following months, I followed up with the Area manager and Plant manager to see how the plant is performing and they both said we are averaging the 375 TPOH since your last visit. The plant manager said thanks for getting us where we needed to be. The crew and I both thought that this plant couldn't do what it is doing today. The area manager said he has used the DMAIC system at another location and is achieving more throughput there as well.

D=efine

M=easure

A=nalyze

I=mprove

C=ontrol

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