producingresults

ec|o´nom´ics ***n.pl*** 1. the study of the production, distribution, and consumption of wealth and capital, especially as it concerns maximizing efficiency 2. economic factors

Tube Mill Economics 101

Applying fundamental laws to a complex situation

By W.B. "Bud" Graham, Contributing Writer

There you are, leaning against a roll stand, reminiscing about the good old days—a time when production runs were long, inventories were plentiful, and profits were decent; when the tube production manager was a guy who worked his way up through the ranks and understood how to make tube; when the sales staff developed business relationships with customers; when maintenance was scheduled and spare parts were kept in inventory; when the employee training budget exceeded management's meals/entertainment budget; when personnel turnover wasn't a problem; when the management team understood the interlocking and dynamic relationships among production schedules, inventory levels, and setup times.

Times have changed, haven't they? Just-in-time and lean manufacturing have put an end to long production runs and well-stocked warehouses. The production manager of the month is some guy who doesn't know an ID from an OD. The industry is so competitive that the sales staff considers itself lucky to get small orders with skimpy margins from surly customers. The beancounters don't allow any spare parts and think that maintenance is an avoidable cost. Well, you get the picture.

The good old days are gone, but not forgotten. In fact, a close look at that era can be more than just a nostalgia trip; it can provide valuable lessons about changing business conditions and practices. It can give you a better understanding of the situation you currently face and guide you to strategies and tactics to help your organization fight its way back to healthy profitability.

Your task is to bring the capabilities and limitations of the tube mill and the staff to management's attention. By using an intelligent, informed, and diplomatic approach, you can be an agent of change and keep your job.

Step 1: Educate and Lead

First, educate. Start with yourself. Learn everything you can about the *capital equipment and facilities* in your plant and the *individual capital* of each member of the staff. These are intimately related to the organization's ability to manufacture products and earn a profit.

• **Capital equipment and facilities.** These are the production equipment and facilities required to support the company's operation. Your tube mill and the plant facilities fall into this category.

• **Individual capital.** Individual capital refers to inalienable or personal traits of persons, tied to their bodies and available only through their own free will, such as skill, creativity, enterprise, courage, capacity for moral example, noncommunicable wisdom, invention or empathy, nontransferable personal trust, and leadership.[1]

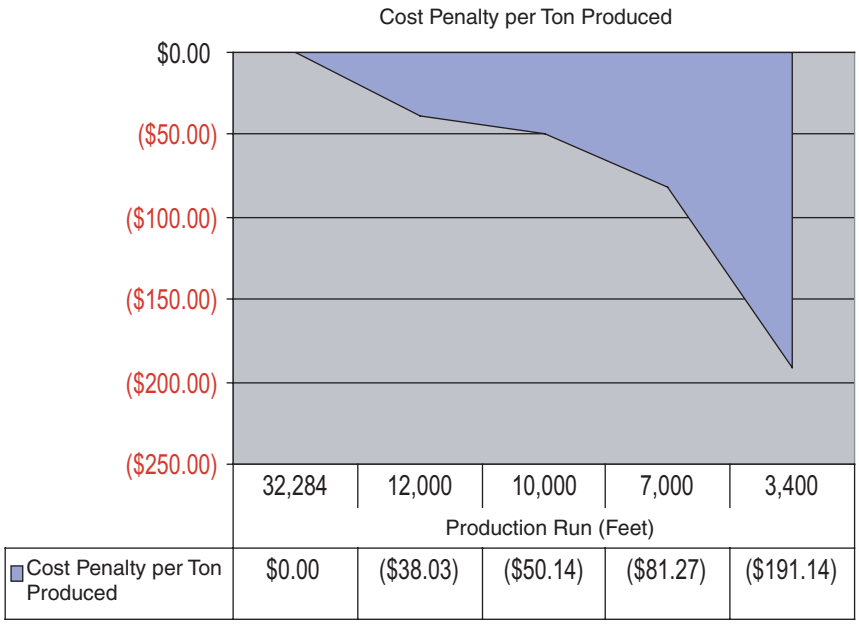

Figure 1

In a tube facility in which maintenance and training are infrequent and minimal, a mill changeover is a five-hour ordeal performed by a two-person crew; the mill must produce 32,284 feet of tube to recover setup and scrap cost. The tube is 2.5-in.-OD × 0.062-in. wall thickness; the raw material weighs 1.61 pounds per foot.

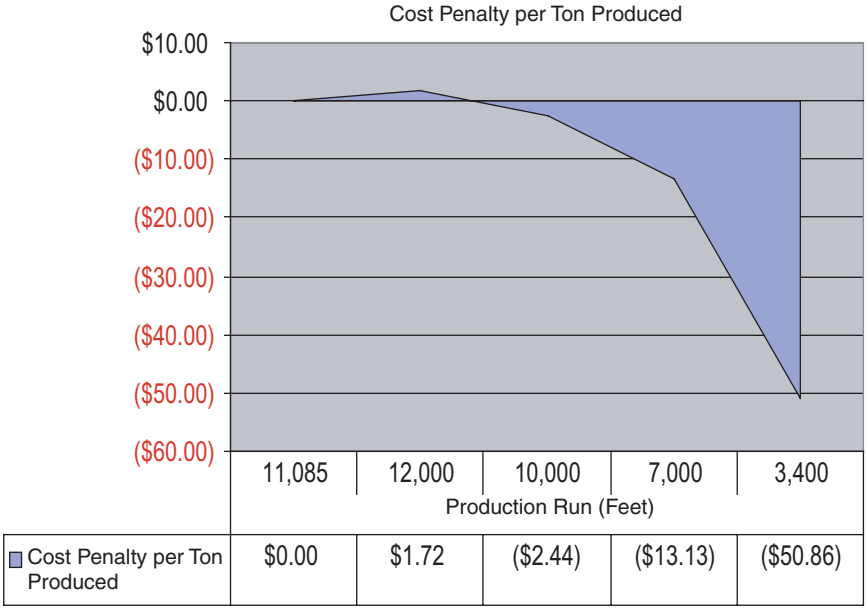

Figure 2

Increased training and preventive maintenance help to reduce setup time. A 1.5-hour setup time changes the break-even point substantially. The mill must produce 11,085 ft. of tube to recover setup and scrap cost. The mill is making the same product as in Figure 1.

You can think of these values as a checking account. With a checking account, you can spend only as much as you deposit, and if you're prudent, you'll keep a little extra in the account at all times. In terms of capital equipment and facilities or individual capital, the principle is the same: The output is proportional to the input, and a prudent manager doesn't overwork the equipment or the employees.

Balancing the Checkbook. If your facility is like most tube plants, management has been running the equipment fast and hard with little or no scheduled maintenance for the mill and tooling and cutting the training budget until there is nothing left. These are the two main internal factors that created the situation you're in right now.

Two external factors are just-in-time manufacturing and relentless competition. These forces push upper managers to dictate that production must change to match demand despite the limitations of the equipment on hand. If you're not careful, the result of operating this way can really hurt, not help, your company's profitability.

When you fail to maintain equipment, its reliability declines. Frequent changeovers cut into production time. Frequent changeovers and breakdowns combine and their effects escalate, gobbling up an ever-greater share of production time. It is not uncommon to see real mill uptime fall to 50 percent. What does this mean at the production level? It means you're in firefighter mode rather than planned maintenance mode, and personnel are stressed and leaving the operation. Maintenance personnel can't get to the mill because of production needs, so repairs are done only when something breaks. You end up taking twice as long to fix the problem (no

parts on hand) and pay a premium for parts or services (overnight delivery or turnaround), which further damage morale.

Remember the definition of individual capital? Let's talk about free will. Employees aren't dumb; many will leave in search of something better rather than continue to toil away at the madhouse you're in. Management needs to understand the true cost of the current operating mode in order to appreciate the changes required to break the cycle of failure.

You are stuck—or blessed, as the case may be—with the production equipment. You're *stuck* if the mill design is conventional and requires removal and replacement of roll tooling. You're *blessed* if the mill has quick-change setups (rafted stands and tools, for example). If your tube mill has state-of-the-art technology, your changeover time, prime to prime, can be as little as 10 minutes. If your tube mill is like the majority of equipment, your changeover times are measured in hours.

When your tube mill is out of alignment, roll tooling is worn, and the finished tube is a difficult reshape product, your problems are compounded and your adjustment time to get a good part increases. To afford new equipment or to upgrade the current mill equipment, tube production must be profitable! This is your day-to-day reality. Your goal is to produce tube at the lowest possible production cost.

You can't control material cost or availability. You can control only the resources at your disposal. The length of a production run should be based on reality and not some decree that defies common sense. This means that instead of doing many setups to make short production runs because steel availability is a problem, you should store the steel you receive until you have enough to make a longer production run.

Look at every product you manufacture and make a production plan based on the degree of setup difficulty, mill reliability, tool set availability and condition, and operator skill level. Set minimum runs based on steel availability, setup time, and a maximum scrap rate of 5 percent. This means you must plan the production to recover the costs of changeover time *and* setup scrap while maintaining the 5 percent scrap level. See **Figures 1** and **2**.

1/4
(3-3/8 x 4-7/8)

1/4
(3-3/8 x 4-7/8)

This is reality—operating in a manner that produces tube at your lowest possible cost per ton based on the tools you have.

Making this happen will not be easy. It will mean temporarily increasing work-in-process (WIP) inventories, finding additional temporary storage (for coil and tube), and negotiating with customers to accept larger shipments. It may even mean convincing sales to fire the surliest of customers, such as the one that insists on paying a commodity price for a premium product or not buying minimum production lots.

Making the transition from firefighter to planner will give you time to make better decisions. This first step allows the second and subsequent steps to be possible.

Step 2: Train and Promote

Planning production to reflect the reality of the facility's capability will reduce the number of setups and increase mill uptime, thus opening the window for planned maintenance and training.

Now is the time to tackle the root causes of failure. Every operation has different major and minor problems. Knock out the showstoppers first, then follow up with the day-to-day difficulties.

If you don't know what to concentrate on first, get help by talking to vendors, consultants, and peers. If you're a member of the Tube & Pipe Association, International®, take advantage of its research center, the Metal Authority.

Start with the basics. Plan roll regrinds based on wear, not failure to produce a good part. Align the mill to get another 20 percent roll life and reduce setup scrap *and* time. Replace wear components based on historical failure rate, not breakdowns, to further increase uptime.

Train employees to understand their jobs from the general to the specific. If you have many new employees, be aware that they probably have plenty of old (that is to say, *bad*) habits. Where does a new employee get old habits? From the supervisor who trained him (or the co-worker who showed him a few shortcuts).

General knowledge is important because it is the frame of reference that everyone needs. Clearly defined goals and a shared knowledge base set the stage for more in-depth training and recognition of the individual capital present in the employee pool. You can't do it on your own, but your leadership will uncover the gems among the personnel, and their contributions will lead to further reductions in setup time and scrap. When you hear managers discussing potential investments in capital equipment, don't forget to remind them to invest in individual capital too.

Drawing up schedules based on reality won't be easy and it won't make you popular, but it is the road that leads to a controlled environment where you and the people you lead stand a better chance of being employed tomorrow and going home satisfied. The most important aspects of individual capital you possess are courage coupled with moral example. These are characteristics people follow and management will recognize as in the company's best interest.

Step 3: Take Action!

Quit daydreaming about yesterday and take action today so you'll still be in business tomorrow—in other words, get your posterior off the mill stand and get started!

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Note

1. *From* Wikipedia, The Free Encyclopedia, *http://en.wikipedia.org/wiki/Individual_capital*