

Ed Kwasnick discusses the fundamentals of sound work flow in large laundry facilities. Second of two parts



# Charting course for **IMPROVED** industrial engineering

## ■ Front-page news

In April, Ed Kwasnick was the cover story subject for *Industrial Engineer*, the flagship member magazine of the Institute of Industrial Engineers, Norcross, Ga. IIE is recognized as the world's largest professional society dedicated solely to the support of the industrial engineering profession and its practitioners.

Industrial engineers improve processes and systems to enhance quality and productivity. They are represented in virtually every industry, including manufacturing, health care, logistics, shipping, airlines, software, the military, and even theme parks.

For more on the magazine and association, go to [www.iienet.org](http://www.iienet.org).

**A**s the proprietor of Turn-Key Industrial Engineering Services, Charlottesville, Va., Ed Kwasnick advises laundries on making the best possible use of their people and plant systems.

While he's often associated with facility construction and renovation, he's also become known for working with existing equipment and reducing its inefficiency. As reported in the April issue of *Industrial Engineer* (IE), Kwasnick and his firm improve your processes, thereby controlling costs and improving quality.

For example, Turn-Key can help you to make the best use of utilities, primarily gas and water, through maintenance and other means. "Any time we can save on the water side or the heat side, any time we can reduce the amount of steam use necessary in a plant, even at a very small level per pound, it becomes a huge dollar figure," he notes.

Following are other intriguing quotes from the *IE* article with follow-up questions from *IL*.

*In his experience, most laundry facilities are planned back-to-front. "Most people have said, 'I think I need about 60,000 square feet.' They build 60,000 square feet. And then they bring in the equipment vendors and say, 'OK, guys, there's the open floor space. Figure out how to lay your equipment in there.' You end up shoehorning things in. You always end up with dead spots or an area where you wish you had a little more space, or wish the column spacing was a little bit wider.*

*"First, we say, 'What's making you money? You're in business to process and deliver laundry. Let's start with the process of laundry and work our way out.' And then the building really becomes more of an envelope than a starting point."*

### **Why haven't more laundries used inside-out design?**

In the past most companies used architects to design their facilities. Architects specialize in designing buildings, not production processes. So, the building design was the starting point and everything else came second.

**When their buildings become outdated, have operators seemed more interested in finding existing spaces and fitting their processes into them, rather than starting with their processes and designing the facility around them?**

Most independents want to find an existing building and turn it into a laundry. There are a number of short term advantages to this strategy. Existing buildings are typically less expensive per square foot than new buildings. Utility impact fees are lower. And because you don't have to construct a building, it takes less time to start production than to build new.

All of these reasons are related to short term savings. However, there is a down side. First, you'd better make sure the building has all the required features to make it an effective laundry. It needs adequate natural gas, water, sewer, and electricity. If these utilities are not available at the building, they will need to be run from a remote location, and that can cost some money.

The building needs the proper column spacing and ceiling height. If the columns are too close together, you may not be able to fit equipment between them in an efficient manner, which equates to a lower production capacity per square foot.

If the ceiling is too low, you may not be able to install overhead material handling systems like monorail, garment trolleys, etc. This also equates to lower capacity and productivity.

If the building structure will not support an adequate additional live load, then all roof supported systems will need to be floor supported, which will add cost to the project.

But even with all these short term cost issues, the one major difference when you retrofit an existing building is that you will inevitably end up with some inefficiencies in your plant design. Because the building is not designed around the most efficient process, you will end up with extra space in some areas, and not enough space in other areas.

The intent is to minimize these inefficiencies. However, the final design will not operate as efficiently as a brand new building designed from the inside-out. Although these efficiency differences might be relatively small, they will cost you money for the life of that plant.

### **When design is backward (space picked first, then process fit into it), which areas often get shortchanged? Why?**

Soil storage, packout, and route storage get shortchanged because those areas don't require equipment, just open floor space; thus, most people don't have a feel for how much space is needed. They don't try to calculate the number of carts that will be stored, or the amount of aisle space that is needed to access the carts, or the process that will be used to pack out the goods.

Adequate dock space to load and unload trucks also gets overlooked. What's the consequence to the laundry? A lot of congestion and chaos at the beginning and the end of the production process, which can lead to late or missed deliveries, poorly utilized inventory, and inefficient production flow.

Just like a chain, production is only as good as its weakest link. It doesn't matter how good your washroom is if you can't get the product packed out and delivered to the customer.

### **Are some operators working from outdated or otherwise misguided rules of thumb?**

Yes, old rules that do not apply. There are too many variables in today's production environment for rules of thumb to be applied across the industry.

For example, two different companies: each processes 200,000 pounds per week, but the first company has traditional healthcare and the second, retail healthcare. These plants will use different equipment, have different utility requirements, and handle and package their products differently.

So the old rule that says, "your plant should be X square feet to handle 200,000 pounds per week" does not apply anymore.



*At Staunton (Va.) Steam Laundry, Kwasnick poses with evidence for his argument that you need to schedule your entire plant to produce the products you need when you need them.*

### **Typically, what are these rules?**

These include:

- Use large amounts of storage (slings or carts) between processes to maximize production efficiency.
- Tunnel washers are for linen and conventional washers are for industrial.
- 50 percent of the cost of a new facility is building and 50 percent is equipment.
- Dedicate certain machines to specific products to maximize output.
- Install two boilers. If one goes down, you will have a spare.
- Oversize your utility systems.

*"Typically, most laundries are designed with a lot of work-in-process buffering storage to keep between processes. So you have all of this capability to produce, and then*

you store it all on the production floor, waiting to go on to the next process.” By emphasizing balanced production flow, Turn-Key shows its clients how elimination of that buffering can ultimately make their plants more efficient.

### **What’s the trick to avoiding buffering, to ensure a steady, balanced flow of work so that you don’t need a lot of room for temporary storage?**

The entire plant needs to be balanced. Each department needs to be properly equipped and staffed to accept the goods from the previous department, perform the work, and forward those goods to the next department at the same rate throughout the entire plant.

And you only produce what you need to meet your demand for that day. If you produce extra product, then you have to store it. If you produce less than what you need, you have to have extra inventory to make up the difference. That is the key to avoiding buffering. And that can only be done if you know exactly what you need to produce at the end of the day and then schedule each department to produce those items when needed.

### **In balancing production flow, which area(s) tends to be the weakest link(s)? Why?**

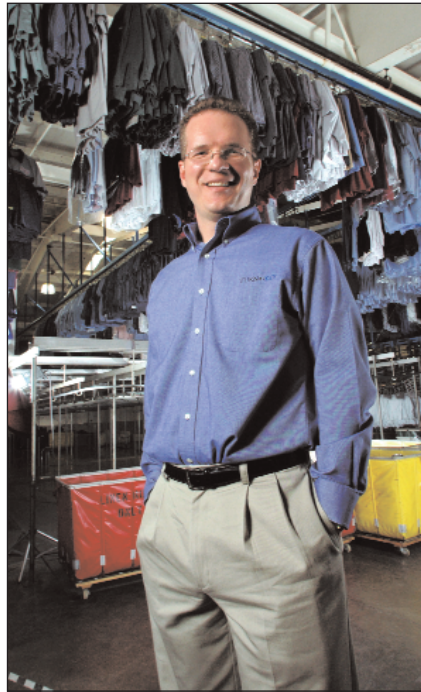
In a linen plant, soil processing (including, counting, sorting, storage, etc.) tends to be a weak link because it is typically understaffed (nobody likes to work in the soil department), undersized (cart congestion is a problem), and under-equipped (very little automation.)

However, soil processing is very important. If you can’t get your linen out of the soil department, then you can’t wash, dry, iron, and fold it, and get it back out on the route.

In an industrial plant, it tends to be the washroom, but not for the reasons you would expect. Most washrooms have excess equipment capacity, but they can’t get the work done due to poor scheduling.

Or the opposite situation occurs. The washroom produces more product than the clean processes (hanging, pressing, mat rolling, folding, etc.) can absorb. So the washroom overwhelms the rest of the plant.

Thus, the single biggest weak link with balancing production flow is lack of proper production scheduling. If you don’t schedule your entire plant to produce the products you need, when you need them, balancing the production flow is a challenge.



***Kwasnick urges using “the cube,” i.e., the space above the plant floor, as efficiently as possible, not only for garment storage, but for trolley and monorail systems, customer bag systems, and automated chute loading for washers.***

Instead of providing two or three big changes that Kwasnick says most of his clients ask for initially, Turn-Key explains how a series of small improvements will add up to the biggest savings over time and lays out an implementation plan. All of this is done with an eye toward long-term return on investment, as opposed to high-concept, low-value improvements.

### **Give some examples of small improvements that tend to get overlooked but add up to substantial money saved (or earned).**

First, standardize your grading system for return-to-stock (RTS) garments and train your grading employees to grade consistently. Then train the picking employees to pick efficiently and trust that products are graded properly.

In many stockroom operations, picking employees will determine that a garments isn’t good enough to fill an order, even though the grading employees have classified that garment as usable. Therefore, graders need to grade and pickers need to pick.

This sounds simple, but most companies do not standardize this process, which leads to poor used garment utilization and high garment costs.

Other steps:

- Companies tend to over dry their laundry. Reduce dry times and reduce gas usage.
- Develop a production schedule to maximize throughput and reduce equipment idle time.
- Look at rearranging the service dates of certain customers to eliminate extremely heavy production days.

A plant’s production goals will change from day to day, with some days being heavier than others. However, extremely high volume days cause excessive overtime and can be very stressful for production employees, maintenance, etc. Move some of the production to a lower volume day to balance out the process.

*“Just like you do strategic planning for sales and marketing, you need to do strategic planning for your production environment. Start with where you want to be 10 years from now and then design your facility to match up with that concept. Then grow into it, as opposed to just growing haphazardly and plunking down a couple of pieces of equipment here and there. (Otherwise), you have to drop bread crumbs to find the product flow.”*

### **How do you explain to people the notion of strategic planning for production, convincing them they should plan and allocate space now for what will happen in 10 years?**

It is very simple. Most companies develop strategic business plans that include growth projections, new business opportunities, changes to their product mix, and other long term strategic goals.

They then figure out how this plan relates to their business: how many new sales and service people will I need to hire, how many more routes will I need, what type of new inventory will I need, do I need additional service tools (handhelds, trucks, etc.), and so on.

We tell our customers they need to take this long term strategic plan and apply it to the production side of the business. Most companies grow their production space without thinking about the future. They need another ironer and they have some space in the back, so the new ironer gets installed in the space in the back.

However, over time, the production space continues to grow haphazardly; becoming congested, disorganized, and less and less efficient. To prevent this from occurring in the future, we tell our customers they need a master plan for their production space. We need to estimate their future growth, convert this growth to production pounds and pieces, and identify the amount and type of equipment to needed to balance the production flow. Then we can design a master plan for the facility and grow into it.

Most companies have run into a situation where they put in a piece of equipment and then have to move it a couple years later because it doesn't make sense to have it in that location anymore. A production master plan eliminates the need for these changes. Now the facility can grow in an organized manner, maintain a highly efficient production environment, and minimize downtime during future equipment installation.

*In streamlining a design, Turn-Key's engineers know instinctively to strive for the Midas touch, eliminating unnecessary production steps and the fat in the production process. "Every time you touch the product you should be adding value to it," Kwasnick proclaims. "You shouldn't be just moving it from point A to point B. Then, you want to eliminate the amount of times you touch it."*

### **Give examples of when touching a product adds value to it, and other examples of when it doesn't.**

We call a touch that adds value from the customer's perspective a "Midas touch." For example, when tablecloths are ironed, this improves the finish quality of the tablecloth and is valuable to the customer. Inspecting garments is valuable to the customer because it identifies holes, tears, missing buttons, etc., which leads to the repair or replacement of the garment, and improves the quality.

Pushing a cart full of sheets from the washroom to the ironing department adds no value from the customer's perspective. In most plants this is a necessary part of the production process. But

**Pushing a cart full of sheets from the washroom to the ironing department adds no value from the customer's perspective**

you did not improve the quality, cleanliness, customization, timeliness or cost of that sheet by putting it in a cart and pushing it to the ironing department. In fact you detracted from the value of your service by adding labor costs, slowing down the process, and potentially diminishing the quality of the sheet by not ironing it in a timely manner.

Some other examples of touches that don't add value:

- Hand loading and unloading washers.
- Clearing carts out of the way so you can move a specific soil cart to your soil count station.
- Picking pressed garments off a press staging rail and placing them on a screw rail to go to sorting.

### **Are there any easy touches bypassed that can create maximum value?**

Just make sure all of your employees understand and adopt your quality standards and use every touch as an opportunity to inspect the quality of your products.

*Turn-Key's engineers urge facilities to "use the cube" and make the best use of vertical space by moving long-term storage and low-value production processes overhead while bringing high-value production down onto the floor:*

### **"Using the cube" is usually a rallying cry for storing garments up high. If they're buffering too much, do they need that much cube space? Or are you saying the cube can be used for other purposes besides rails?**

Actually, "using the cube" is a rallying cry for using the volume of space above the plant floor in an efficient and effective manner, but not necessarily for garments. If we reduce buffering, we still need space for garment route storage (trolley systems), soil and clean monorail systems to deliver products, customer bag systems, automated chute loading for washers, vacuum soil count systems, garment tunnels on mezzanines, mezzanine level storage, automated garment sorting, etc.

*By helping uniform distributors move their highest-volume items closer to the picking center and pairing the most common-colored pants with the most-often coordinated shirts, Turn-Key helped clients employ IE principles that have been in use in other industries for decades.*

### **Explain how you have moved high volume items closer to the picking center and pair pants and how you have better coordinated pants and shirts.**

In a garment stockroom, we collect data about the usage of each stockkeeping unit (SKU). We then identify the high velocity SKUs, i.e., those products picked the most to fill orders. About 20 percent of SKUs account for 80 percent of inventory movement. So we locate that 20 percent closest to the order processing area.

This reduces travel distances and time required to pick orders. In addition, we look at colors and styles of shirts and pants

matched together most during the order fulfillment process. Then we store those products adjacent to each other to improve picking speed.

*Kwasnick says there's a misconception that going in and muddling with a system is inherently a good thing. "Change isn't good. Improvement is good. Change for the sake of change doesn't really do anything except confuse people. So we talk about change plus the benefit equals an improvement, and that's what we're really going after when we're talking about process improvement."*

**How often do you run across people who want change for change's sake, rather than identifying improvement opportunity first? Give some examples of projects you've undertaken in which the client opted for a series of smaller improvements rather than a big change.**

Not very often. Most customers want to improve their operations, not just change them. Change is difficult and costly. Most companies want to know what the benefits are if they implement change.

However, we do run into the "keeping up with the Joneses" approach to process improvement. A company identifies an opportunity for improvement, implements a new process, and then realizes a big benefit. They tell a couple of other companies

about their success, and then those companies implement the changes as well.

Benchmarking other people's process and identifying best practices is definitely a good thing. But just because the process improvement worked for Company A does not necessarily mean it is the best option for Company B.

Each operation is different: equipment, product mix, philosophies. You need to properly evaluate the operation to make sure that an improvement in one part of the plant doesn't cause negative effects in another part. That may mean customizing the process change to meet your specific needs.

Two years before SITEX Corp. (Henderson, Ky. independent) moved into their new plant, they hired us to identify process improvements in their old one. They aimed to enhance production to improve:

- Profits and help with the fiscal transition to the new plant
- Production processes and methods, so they could carry those improvements over to the new plant.

We also performed process improvement work for Budget Uniform in Gardena, Calif. They had an efficient plant and enough production capacity to get the work done, so they did not need to make big changes. However, they were looking for opportunities to save money and increase their profits through process improvements. In most cases, seek these, and ye shall find them!

