

# OEM

*Off-Highway*

HELPING MANUFACTURERS COMPETE IN TODAY'S MARKET



The Charles  
Machine Works uses  
teamwork for  
continued success

Dana Plymouth  
translates a vision  
into results



Coming full circle in Perry, Oklahoma.

## Using teamwork to stay competitive

By Kay Falk

As you drive west from Tulsa and cross Cow Creek to Perry, Oklahoma, you're about to be pleasantly surprised. This is the home of The Charles Machine Works Inc. (CMW), makers of Ditch Witch underground construction equipment. Started over 40 years ago in a small metal building in this quiet town of 5,000 people, CMW is a market leader. The man who invented the trencher that launched the company lives just a cattle pasture away. Ed Malzahn's still involved in the day-to-day operations. CMW is unique in many ways, but it's attacking the same issues confronting other global competitors. By using the strengths of its people, the company's returning to techniques that made it successful in the first place.

### From simple roots

Carl Malzahn, Ed's grandfather, came to Perry in 1902. He opened a blacksmith shop with his two sons, Gus and Charlie. By the mid-1940s, the business was known as

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— Barry Blades  
Manufacturing Manager

Charlie's Machine Shop. Ed had just returned from college. One day he watched the local plumber hand-digging a trench to lay utility service lines. Thinking there had to be a better way, he set to work and invented a trencher small enough to work in confined areas. As the story goes, he never sold one to the local plumber, but that fellow borrowed it a lot.

The trencher did catch on with other utility contractors, however, and Charlie's Machine Shop became The Charles Machine Works Inc.

In 1959, the company outgrew its downtown location and moved outside of town. Today, well-groomed lawns, a pond and gazebo give you a feeling CMW's a special place. Inside, beyond the spacious reception area, an atrium fit for a four-star hotel beckons you to have a cup of coffee and relax on white wrought-iron benches. If you go down the hall, you pass bathrooms marked "Witches" and "Warlocks" (Ditch Witch, get it?) and conference rooms named after soil types.

The atmosphere seems casual. No one, unless leaving town, wears a tie. But don't let that fool you. These 20 acres of production area create the broadest line of underground construction equipment in the industry. It's where the majority of the units sold in the market has been manufactured. Where more than 125 independent dealers around the world are serviced, supported and trained.

### People make it happen

The Ditch Witch line includes trenchers, vibratory plows and guided boring systems. Barry Blades, manufacturing manager, says as the company makes this equipment, it has three goals — to move from push to pull systems, from non-value-added work to



This computerized multiple machining center has 150 tools and eight pallets for making gearboxes. This cell includes two assembly stations, a washer and deburrer, so when a gearbox leaves on color-coded racks, it's ready to bolt onto a machine.

value-added and from process to product focus. CMW aims to do this by using its best and most unique asset — its 790 people. According to Jeff Griffin, advertising coordinator, the workers and their attitude are what makes CMW special. "There's a strong loyalty to the company. The man who owns it unquestionably still runs it. He invented the mainstay product. It makes you feel good to know your company developed the equipment and is the industry leader." Blades agrees. "As a manufacturing entity and in the challenges we face, we're not unique," he says. "But there's tremendous employee loyalty, coupled with a pioneer spirit. Our people tend to be independent thinkers, yet once you get them on your side, they're intensely loyal."

Focusing those people toward a team approach to manufacturing is what Blades, a former consultant, is about these days. He's getting help from a 25-year veteran, Lyle Jerome. Jerome is a facilitator in the manufacturing services group. He assists with team meetings, sees that people who can help line teams get involved and keeps the ball rolling toward modern manufacturing techniques. But are they really so modern?

"When I first came here, we were working in ways we're trying to return to today. It was a small

company where everyone had to do many things. We had fast flow and small batches. People would see a piece of equipment through the whole manufacturing process," Jerome explains.

As the company grew, it shifted to batch processing and separate departments. They cared about department efficiencies, not what was happening in other parts of the plant. "In the past 18 to 24 months, I've seen teamwork again and coordination in the whole company," he says.

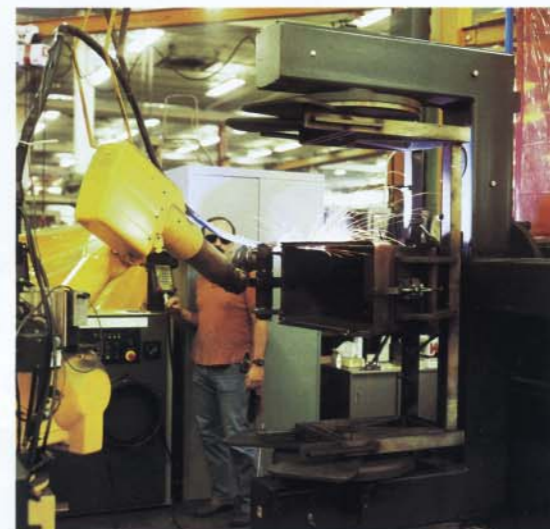
Other help comes from the corporate trainer. He's trained the manufacturing managers, who in turn pass teamwork education on to their workers.

### Teams attack waste

Teams are working in all areas of the plant. Sam Harman, supervisor of the purchased parts warehouse, says one project reduced hardware inventory by 80 percent and improved in-plant service without cost increase. There are now just two sizes of containers. Each box, which sits on gravity-feed shelves, has a kanban label. It states the part number, container size, quantity and workstation number. When the supply gets low, a worker takes the label off and faxes it to the vendor, who replenishes the stock weekly. Some teams are creating cells. According to John



Ditch Witch products' bright orange paint is applied just before the final assembly process. Some painting may be moved closer to the assembly line as part of the company's focused factory approach.



When the company selected a robotic welder, three employees were part of the process. The operator, working on an 18-inch backhoe bucket, says hand-welding took five hours but with the robot it's down to two hours. Besides speed, he notes the robotic welder removes the operator from fumes, smoke and sparks, as well as reducing fatigue.

Inselman, division manager, manufacturing cells are run by the machine operators. Using kanban cards, teams schedule work, referring to the master schedule when priority conflicts arise. They also arrange the machines for efficient production.

"Teams have been in place for eight months and appear to be working well," he says. "The biggest benefit is that employees get a say and take an active role in the process, instead of being told what to do." He adds that teams meet weekly to discuss needs and problems, to determine costs and try to reduce them.

Leo Sloan, machine shop supervisor, is enthusiastic about a turning cell. Here, seven large lathes, some automated, are run by five operators who rotate jobs each week. Benefits of this rotation include fewer personality problems because workers aren't always near the same person, and cross-trained workers keep production rolling even when someone is ill. Cross-training is important, too, as the company moves from process to product orientation. In October, the assembly area for Model 3500, a 35-hp hydrostatic trencher, became a focused factory.

Jerry Houska heads up this area. He says the assembly workers conducted group interviews to select new team members as the area grew to include welding and subassembly. The 15 workers are being trained on all equipment and will be called manufacturing technicians.

The line is U-shaped, with subassemblies feeding it at the point of use. Frames and other components

are welded as needed, while in the past they were made to stock. Reduced work in process frees up space so related machining processes and final assembly operations can be moved to the area.

Houska also points out the plant has no inbound inspection, unless the part is a first-time buy. There are no inspector jobs; operators are responsible for quality.

The company's organization is shifting to product managers and simultaneous product development (SPD). "It follows teamwork thinking," Blades says. "Cross-functional teams make for faster product development. We want to address, up front, fabrication, fixturing and serviceability issues, plus consider customer needs."

Of course, customer and dealer input is essential. Blades adds, "We've strengthened our market and product management group so we can improve our customer focus. Everything else is moot if we don't meet their needs."

All the changes at CMW come back to teamwork. Salespeople meet together once a month to report input from the field on a regular basis. Manufacturing teams create cells. Groups decide on what new welding equipment is needed. Teams focus the factory along product lines.

"We may report through a traditional hierarchy, but we develop teams as we need them," Blades says. "Changing lines on an organizational chart isn't going to make things happen. Nothing really changes without teamwork." **OEM**

## One on one with . . .



Edwin Malzahn, President  
The Charles Machine Works Inc.

### What's been the biggest change in manufacturing since you began The Charles Machine Works?

As my lifetime's concerned, it's been computerization. Now there are numerically controlled machines and management and process controls. I was raised in a hands-on, highly skilled industry where we were called mechanics. We came through long apprenticeships, which isn't the case any more.

### Apprenticeships are still prevalent in Europe. Is that a failure in the United States?

I don't think it's a failure at all. It speaks well of adaptability.

If there's a uniqueness in our company, it's the flexibility of the people. Many who've come to work here, during the hiring process, I'd ask them, "What do you want to do?" Often the answer was, "What do you have to do?"

We have fairly level employment, although the work load goes up and down. This shows employee flexibility. A welder will paint ceilings, if that's what needs to be done. And our people do it without loss of dignity.

### Are there other things that make your company unique?

We believe in employee ownership. We've had an ESOP (employee stock ownership program) for the last 30 years, before they were called ESOPs. Employees own stock in the company through their pension trust. They're the largest single stockholder.

We're also a relatively conservative company. We've always operated without borrowed capital and never had a negative profit quarter.

### How do you react to your industry's changes and demands?

We're highly customer oriented. We strive to be vertical — from identifying a need, designing a product, manufacturing it and selling it through a dealer organization.

There are more people employed in the dealer network, selling and servicing Ditch Witch products than there are manufacturing them. They're part of the worldwide system. We work diligently to support them.

Dealerships are all individually owned. We're firm believers in entrepreneurship. But as far as the customer is concerned, when he walks in the door, he's talking to the company.

### What's today's biggest manufacturing challenge?

We sell a lot of equipment, and not many are exactly the same, so our process has to be highly flexible. Things that allow us to do that are focused factories, cells, short-interval manufacturing. The challenge is doing that at a price the customer can pay.

### Will there be many entrepreneurs like you in the '90s?

It's more difficult to start a company like this. We're being held responsible for society and employees. The cost of employee benefit packages, legal fees, those sorts of things make it difficult for a small enterprise of any kind to operate. A large portion of our resources are devoted to activities that add no value to the product.

We in America are probably losing a lot — most ideas for new products in the last century have come from a guy with an idea who starts his own little company.