QDC ROI, PDQ

Follow these steps to successfully complete a quick-die-change return-on-investment analysis "pretty darn quickly"—your competitive future might depend on it.

BY BRAD F. KUVIN, EDITOR

Industry sources I spoke with regarding how to successfully develop a quick-die-change (QDC) strategy—one that management will buy into and your financial folks will approve—agree: Include your accounting department in your production-flow and die-change procedure overview right from the start. This will ensure that any funds needed to implement your plan, included those for purchasing new equipment such as clamps and die carts, get approved in a timely manner and allow your QDC production team to implement your great ideas related to QDC. And, including financial folks on the planning team will ensure timely definition of an acceptable justification formula at the beginning of the project, eliminating any back and forth proposal iterations that will undoubtedly delay the process.

Where to Begin?

But where does the QDC team begin in its journey to reduce the time needed to transition a press line from last part off of an existing job to good first part off of the next project? Start with a detailed analysis of every single step required to transition the line from one job to the next.

"Start by building a QDC implementation team comprised of people representing several departments within the company," suggests Patrick Richardson, consultant for QDC Systems and Engineering and Rico Equipment, Medina, OH, a manufacturer of specialty lift trucks for die handling and other applications. "The team should include people from management, engineering, maintenance and production. And yes, accounting. Together the team should immediately define its goals for implementing QDC procedures and equipment, with clearly defined measurements—realistic and attainable—that define success.

"In addition to reducing changeover times," Richardson continues, "goals might include reducing in-process inventory, increasing press uptime (to the point where capacity is increased enough to perhaps delay a pending new-press purchase), and improving workplace safety and ergonomics. In fact, cost avoidance by improving operator safety has been a huge ROI angle for many of our customers in the metalforming industry."

Whether focused on every press line in the plant or just a few where the team decides it can get the biggest return, based on part volumes and current production performance measures, the process begins with a careful and detailed study of press-cell layout and material flow. Says Cliff Drake, president of EAS Mold & Die Change Systems, Menomonee Falls, WI, a manufacturer of clamping systems, die splitters and turning units, die carts and other QDC equipment: "We recommend that for each press cell under

Using a dedicated die-change table will avoid die-change delays caused by waiting for a multitasking fork truck or overhead crane to become available.

Stampers that standardize their dies as much as possible can more readily take advantage of a locating system like the one shown here with a system of clamps and die lifters.

investigation, the team document every step taken to successfully complete a changeover. And, it should do so for several die changes, not just one, to gain a clear and accurate picture of what's happening on the floor in order to identify every bump and bruise along the way. Take detailed notes, and even consider videotaping several die changes to identify opportunities to save time. Is your die-change team wasting time looking for the die, waiting for a lift truck or overhead crane to become available, or trying to find hand tools that have been misplaced?"

Look at Layout

Other areas to focus on include ensuring the press cells are laid out to allow quick and efficient movement of dies as well as coils of stock in and out of the cell. "Look for ways you can redesign the cell, perhaps by simply reorienting a conveyor or other pieces of equipment, so your die-change specialists can perform several operations simultaneously," adds Drake.

Yes, there's plenty of equipment out there to help metalformers streamline their die-change processes. But before evaluating the new technology available and getting out the calculator to total up the amount of money that might be needed to purchase those items on the shopping list, the QDC team should review the step-by-step die-change analysis and watch the tape over and over. Its focus should be on looking for steps that can be eliminated from the process without spending too much money up front.

"Focus on how to properly and efficiently perform your die changes," says Richardson, "rather than on why you need to achieve QDC. "Standardize your dies, where possible, with common backing plates, bolt sizes and passline heights, for example, to speed the process and eliminate steps. Keep clean and up-to-date part prints at the press that include a mechanical detail sheet showing the required press adjustments."

What You Need, When You Need It

Many a 20-min. die changes has been extended to 45 min. or even longer as technicians search high and low for misplaced tools. Cure this all-too-common problem by establishing defined setup carts equipped with all of the tools needed to perform a die change, including extra clamps and hoses. Dedicate one or two or these carts and the tools they store only for die changes—buy an extra wrench or two if need be just so the die-change tool carts remain stocked and ready to go.

"And don't allow anyone—including maintenance or repair people—to remove tools from the carts," says Drake.

Adds Richardson: "Even before beginning a die change, ensure your scheduling procedure calls for inspecting the die, maintaining and cleaning it well before it's scheduled to be installed on the press. This will prevent your press and operators from sitting idle waiting for last-minute (and rushed) die maintenance."

While sound scheduling practices will address the die-maintenance concern described by Richardson, Drake takes the notion one step further. "In terms of scheduling your pressroom and toolroom," he says, "die changes can be performed more quickly and efficiently—with fewer steps—if shops get away from the concept that every die should be capable of running on every press. Your QDC team should look at your inventory of frequently run dies, and your presses, and categorize your dies based on size, tonnage required and the width of the material being processed. By earmarking certain dies for a specific press or perhaps a few presses, we see metalforming companies eliminating setup steps or minimizing the time needed to perform certain die-change procedures. For example, you'll be able to use a locating system in the press with stops and pins to help your operators precisely and quickly locate dies in the press," Drake adds.

Better Clamping—Take the Plunge

The time has come for stampers to evolve beyond manual die clamping, say Richardson and Drake, to not only speed die changes but to also safeguard workers performing die changes. Tasking

Want More?

The Precision Metalforming Association offers a 90-min. webinar–Quick Changeover Simplified–that explains in greater depth many of the ideas covered in this article, including how to prepare an employee project team, establish a baseline and standardize your equipment and procedures. Archived for download at www.pma.org/webinars/past-webinars, it's presented by Fletcher Birmingham, president of Summit Business Consulting, Inc. Price: $100, $75 for PMA members.

operators with climbing up and around presses to install and manually adjust clamps is an accident waiting to happen, as is having workers pushing and pulling heavy dies in and out of the presses.

"Hydraulic clamps fixed to the press bolster and slide provide consistent clamping force, and won't get misplaced, lost or moved somewhere else so that your die-change team can't find them," stresses Drake. "And, these clamps can be set with a pushbutton control at the press main control panel. Same goes for magnetic clamps, which in addition provide a nice, clean bolster and slide to more readily accommodate larger dies that encompass the entire press bed."

While magnetic die clamping has long been accepted by injection-mold shops, metalformers just now are beginning to accept the technology as safe and efficient.

"It's a leap of faith for many," adds Drake.

Improved Safety Will Pay for Itself

Also providing a safer die-change environment for operators is use of powered die-transfer mechanisms on die carts and dedicated die-change tables, rather than relying on multitasking fork trucks or overhead cranes that might not always be available when your press operator or die-change team needs one.

"Die carts and custom-designed lift trucks for die handling can help ensure the press and die remain in perfect alignment during a die change—while removing one die and installing the next," says Richardson. "And when moving larger and heavier dies, carts and trucks can be equipped with power transfer mechanisms to relive operators from having to push and pull the dies in and out." Some die-handling trucks are even equipped with video cameras and monitors.

Die carts also can be designed to handle both dies—the existing die being removed from the press and the new one being installed—in one handling, says Drake.

"We can develop a double-decker die cart, or a side-by-side setup," he says, to allow an operator to pull one die off and set up a new die in one operation, without any repositioning. You can't do that with a fork truck or overhead crane, and lift trucks tend to cause a lot of damage around the shop.

"And yet another option is the use of dedicated change tables," adds Drake: "Set them by the press and roll a die out of the press, move it over and ro.ll the new die in. These tables can be fixed by a specific press, or mounted on casters or on rails to move from press to press.

"Setup-reduction programs require continual attention and work," summarizes Drake. "As you go you learn, and changeover time will continue to shrink—once you get started with the process, that is." **MF**