Klingelnberg-Oerlikon Technical Center

HELPS DANA CUT CYCLE TIME

Approximately one year ago, Dana Corp.'s facility in Glasgow, KY, found itself—in the words of one of its manufacturing engineers—"in a very severe situation."

Specifically, part demand was such that the facility was not able to achieve desired capacity levels, says Lance Dement, manufacturing engineer and Six Sigma black belt at Dana.

One production gear used in a Class 8 truck axle was an 8822 steel part approximately 18" in diameter and weighing 100 lbs. before tooth cutting. In order to meet the capacity requirement, operators needed to remove 17 lbs. of steel and reduce the cycle time to less than 12 minutes.

The solution, as it turns out, was the right combination of machine and CNC control: the Klingelnberg C60 equipped with a Siemens Sinumerik 840D CNC.

Produced on a C60 at Dana's site in Glasgow (KY), this gear was used in a Class 8 truck axle.

Klingelnberg of Germany, recognized as specialists in servicing gear machinery for automotive, truck, bus and off-road heavy axle manufacturers, wanted to provide the market with a more universal machine with an easier-to-use programming interface, fitted with a controller that provided optimum drive accuracy and maximum diagnostic capability. And the cheaper this could be done, the better.

After weighing several alternatives, the engineers at Klingelnberg settled on the Siemens Sinumerik 840D CNC to provide onboard control of linear and rotational axis movement.

Klingelnberg chose Siemens controls to work with its C27, C42 and C60 spiral bevel gear cutting machines because of the control's self-diagnostic and intuitive troubleshooting capabilities. "The user interface is very powerful, especially when locating the root cause of a machine problem," says Frank Irey, vice president and general manager of Klingelnberg's U.S.-based service division, Klingelnberg Oerlikon Technical Center (KOTC).

The Klingelnberg C60 and the Siemens CNC were a natural fit, according to Irey. Klingelnberg had previously utilized the Sinumerik 840D CNCs for its line of G30/G60 bevel gear grinders and B27 blade grinders.

All of these innovations did not mean totally smooth sailing for the manufacturing operation. Dement says that initially the cutter damage was serious, and the team had to work around it by reducing the transit time while maintaining cutter life.

Klingelnberg devised a program with the Siemens Simatic Step 7 software to enable Dana's operators and production engineers to monitor and adjust the cycles for overall process improvement. These adjustments were easily made by Dana's operators to quickly maintain quality. The cycle time was cut in half.

KOTC is continuing to work with Dana to enable the company to store gear programs on a network. "The cutting machines are networked to the Klingelnberg P Series inspection machines and are

Application engineers maintain the Klingelnberg C60 gear generating machines.

being equipped with our KOMET gear cutting corrections software package, so machine corrections can be directly transferred from the inspection machine to the cutting machine controller," says Irey. "This is primarily to eliminate 'fat finger' data entry error."

Every C Series machine comes with a LAN card in the controller that accommodates LAN connections. The connections are then used to store and retrieve program data off-line within the company. Also standard to this series is a modem that can be connected to a standard telephone line. So, a dial-up connection can be made that facilitates on-line, real-time service diagnostics from the KOTC facility in Saline. The service also supports software upgrades, and customers can download them remotely. According to Irey, most of KOTC's customers use both features.

"KOTC offers the best possible support for their machine tool operations. We often talked in the middle of the night about various service issues," says Dement. "They definitely have an edge." ■

The Klingelnberg C60 spiral bevel generating machine w/Siemens SINUMERIK 840 D CNC on board.