

One Way to Save Over A Million Dollars During Tight 2001 Market Conditions

By Darryl D. Davis, Eastman Chemical Corporation, Kingsport, TN

Late in 2001, Eastman Chemical Company's shops and services division commissioned the technical team to replace our aging Bullard VTL. The directive was to increase table capacity from 86 to 100 inches, have two heads, and have one to be CNC capable. After researching new machines on the market and associated risks versus cost of purchasing a used machine, we decided to explore the idea of an in-house mechanical, electrical, and electronic rebuild on our own.

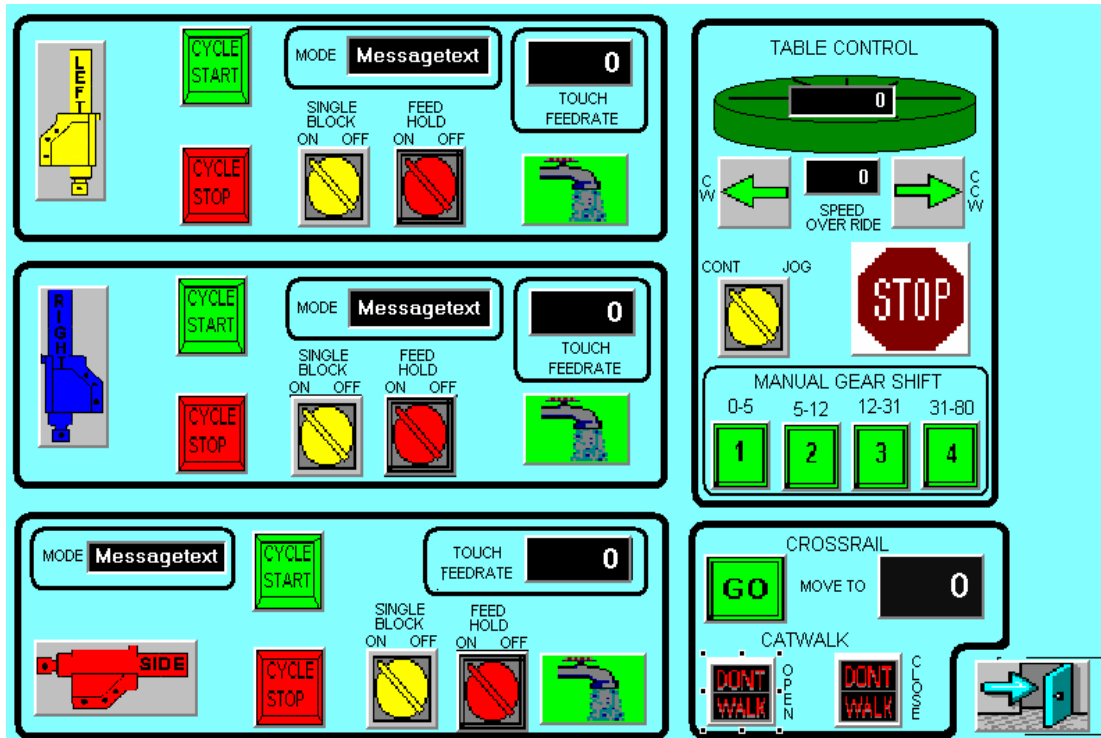
Our group had already retrofit and rebuilt six machines in the past from PLC to CNC retrofits, so we felt confident in undertaking the task. We found the machine that fit our needs from a machine broker and were able to come up with a concept machine that would not only meet but exceed our needs. Working closely with Rockwell Automation on our drives and control package, we felt confident in a successful conclusion. For one year, with a team of four, we set about completely restoring the machine mechanically to accept a full three-head CNC machine. This 186,000 pound machine was set on 400,000 pounds of concrete, and the electrical/electronics integration began.



186,000 pound Rafamet 3 headed VTL

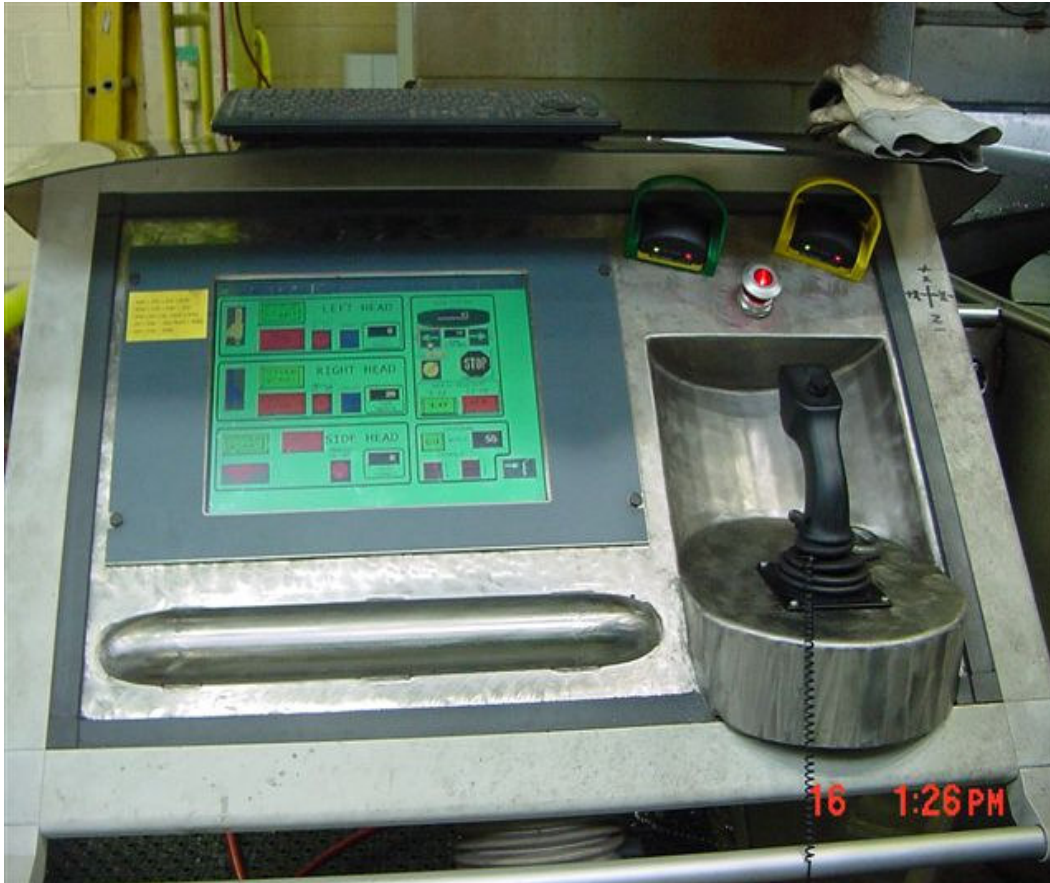
The machine is a large Vertical Turret Lathe, meaning that the parts lay flat and are turned on the table as the heads cut from above. Some machines have one head, most have two, ours has three. The reason we kept the third head (the side head) was

that we have applications where the left head would be cutting, the side head would be cutting, and the right head would be used as a live center to hold the part steady. The manufacturer is Rafamet, a Polish company, model KC250 manufactured in 1982. We chose this machine because it was in excellent shape. It already had ball screw drive trains and had a lot of mass. Heavy castings are critical for us as we turn and machine a lot of very hard metal; therefore, this machine provides us with strength, stability and the ability to dampen vibration in a large work envelope.



Main Operator Screen on 15" Touch Screen showing 3 independent part program path VTL heads on the left and table controls on the right. Screens were developed using the standard MachineMate Visualizer Software Tool.

The original machine was a manual machine but mechanically capable of being under CNC control. We have a need to quickly cut shapes that a manual machine would have to use forming tools on; therefore, a CNC would reduce cycle time.



Airplane joystick shown on lower right side of Operator Panel allows multiple axes movement when in manual mode.

The machine proposal was for three independent running heads with a common table. Furthermore, the machine was already built with Rockwell I/O and device net communications. The control panel had already been designed and built with no discrete MTB panel switches. The control must be capable of interfacing to a custom built soft MTB panel.

Our group consistently does research on existing and emerging technology for possible integration into our shop. Our first priority is to know how flexible the control is and the ease of integration.

In this particular case, the MachineMate was the only logical choice. Having eight station capabilities (up to eight separate part program paths simultaneously), being PC based and DeviceNet capable, and having the visualizer program (a customer HMI screen development tool) gave us the flexibility in control that we needed.

We have been able to increase capacity, throughput and capability with this project while generating a cost savings of over a million dollars.

Eastman is a company dedicated to technological advancements. As an integrator, we try to provide flexible technology that has the capability of changing and growing as

our shops needs grow. This project has exceeded the basic expectations of the machine. This was a very aggressive concept and without the multiple station capabilities of MachineMate, success would not have been achieved



Eastman Retrofit Team: From Left to Right: Mike Brotherton, Procurement, Tooling & Part Programming; Darryl Davis, Control System Integration & Rebuild; Dan McMurray, Part Programming, Tooling, and Machining Consultant; and newest team member Keith Hackler is a CNC Implementation Specialist.

MachineMate stepped up when others stepped out. We had a very steep learning curve to accomplish this project on time and under budget. Every step of the way, all of the MachineMate staff from Customer Order Support to Technical Product Support were very supportive and helpful. It is a tremendous value to have a resource network who not only knows your name but your current project as well. The MachineMate Product Support Engineers were always ready to help and understood our lack of experience on this new control.



Eastman Chemical Company, Kingsport, TN Facility

Eastman Chemical Company (NYSE:EMN) manufactures and markets chemicals, fibers and plastics worldwide. It provides key differentiated coatings, adhesives and specialty plastics products; is the world's largest producer of PET polymers for packaging; and is a major supplier of cellulose acetate fibers. Founded in 1920 and headquartered in Kingsport, Tenn., Eastman is a FORTUNE 500 company with approximately 12,000 employees.

Rockwell Automation (NYSE: ROK) a leading automation supplier with World Headquarters in Milwaukee, Wisconsin helps businesses succeed and grow with power, control, information systems and services designed to give their customers a competitive advantage. With annual sales of \$5.003 billion dollars and 21,000 employees serving customers in 80 countries. Visit www.rockwellautomation.com for more information on Allen-Bradley drives.

MachineMate, Inc. supplies a family of premier PC-Based CNC Products. The use of Microsoft Windows or Linux, a standard PC motherboard and standard PC components makes for an economical CNC with lower cost of long term ownership. High performance proven CNC System software with many built in macros allows for simplified integration of 1 axis to 64 axes machines of simple or very complex requirements. An IEC-1131-3 soft PLC built into the CNC allows for easy integration while an offline "Dry CNC" development system allows for simulation and remote development. Ethernet and Field Bus capability and support for either industry standard analog and/or digital SERCOS drives gives this CNC the utmost flexibility and openness available today. The result is a CNC that is high in features and capabilities but at an economical cost. For more information visit www.machinemate.com