



Beating the Squeeze

Shop Management System Helps Mack Engineering Work Lean

By Maureen Fischer

COULD SHOPS BE SQUEEZED ANY TIGHTER? Rising material prices compress profits. Escalating fuel costs and higher equipment and labor costs constrict earnings. And customers continue to demand double-digit cost reductions.

Like most shops, Mack Engineering Corporation in Minneapolis wages the endless battle to work leaner, retain customers, attract new business, and grow. In the past year, this thirty-person machine shop reduced work-in-process inventory by 50 percent and substantially increased gross profits. Though sales remained steady the last three years, the business flourishes with thirteen fewer employees.

More than anything else, Mack Engineering President Jackie Salisbury credits JobBOSS (Exact Software, Minneapolis, Minnesota) with being the high tech tool allowing them to do more for less, survive the "non recession," and refocus the business with an emphasis on more complex parts.

Mack Engineering has used JobBOSS since 1984; they were the company's first customer working hand in hand with its developers to advise and beta test. Salisbury bought the business in 1993 and has stayed involved with JobBOSS at the design level.

The Quoting Counter Punch

The last three years, Salisbury has aggressively expanded the shop's use of JobBOSS in order to work leaner as they took on more complex work. She has used the system's quoting functionality to speed jobs into production and to help counteract rising material prices, which in turn has strengthened customer loyalty.



JobBOSS scheduling keeps high tech equipment fully loaded to balance the workload and to deal with change.

Since JobBOSS expedites the quoting process, Mack Engineering incorporates detailed routing and materials into every quote. Sometimes estimators sync the quote with MicroEstimating (Micro Estimating Systems, Inc.), which does cycle times and

helps determine precise manufacturing times and product cost. The benefit is that accurate and thorough quoting jumpstarts the job once it comes into JobBOSS, so the quote, complete with routing and materials, moves immediately to a job and into production.

Costs of aluminum, stainless steel, and plastic have soared lately. Overall use of the system at a deeper level has yielded big productivity gains that Salisbury is using to help counteract rising material prices. When possible, she passes these gains on to the customer by not charging them for material price increases. Either that or quoters put the system through its paces to give customers the lowest estimate possible.

"Let's say the price of material was 40 cents a pound last time we ran the job and we did okay," says Salisbury. "Now the price is \$1.25 a pound. Sometimes we can still sell the part for the same price due to our productivity gains. If that's not possible, we quote it both ways and show the customer that the increase in cost is solely materials."

Smart Scheduling

A year ago, Mack Engineering automated scheduling to help the shop stay fully loaded, to balance the workload and deal with change. JobBOSS scheduling now moves jobs through more quickly,

yet accommodates internal and external change, last minute rush jobs, and customer requests.

“Shop managers hold daily production meetings and project the schedule on the wall for all to see. We also check in with ShopBOSS, an automated white board for processing change orders and expediting rush jobs, constantly. We plug in a job, do a what-if. If it all turns red, we know we have to move things around. It’s very visible that way, says Salisbury.”

A Different Kind of Growth

Though sales remain static, other factors signal a healthy expansion in the business, such as the significant increase in gross profits.

According to Salisbury, about 70 percent of Mack Engineering jobs are repeat. In addition to accurate quoting and realistic scheduling, routine analysis of repeat work has affected the shop’s gain in gross profits the past three years.

JobBOSS’ detailed job cost and part history reports enable Salisbury’s team to analyze performance job by job.

Mack Engineering also set a goal to reduce WIP inventory by 50 percent last year and succeeded in meeting the goal. In the process, they began running blanket orders through JobBOSS in a new way. Rather than set up a year-long job, or twelve different jobs, they run one master job and set up releases as the parts are needed. All records are in one place. They receive one basic PO from the customer. They order materials on a JIT basis.

Quality too is receiving a shot in the arm.

“We’re doing Pareto charts which show you repeating causes of problems,” says Salisbury. “But the JobBOSS Toolkit will make those causes jump off the page. Would it be beneficial to rework a part? Or just make the whole thing over? What are the repeating causes? The Quality Toolkit answers those questions.”

Three years ago Mack Engineering achieved its ISO 9001:2000 certification. Salisbury believes the system JobBOSS accelerated their certification and continues to add ballast to the shop’s expanding quality efforts. “I didn’t realize we’d have such a leg up with JobBOSS,” says Salisbury. “It was a

big help at the start and continues to reinforce our quality system. Basically, there is a lot of documentation required, and the records and backups are all in our system.”

People Power, New Equipment

Though Mack Engineering’s sales volume remains the same as three years ago, the work now gets done with thirteen fewer employees. Profit is up. Inventory is down. Salisbury knows part of that is due to JobBOSS.

But she is quick to give plenty of credit to her workforce. “Our success is truly due to the creativity of the people that work here. They think out of the box. It’s really fun to watch.”

She believes in investing whatever it takes to attract the best people. “The workforce here is very professional. The industry has changed so much— it’s not a blue-collar industry anymore. These are professionals, trades people, an extraordinary crew. For instance, we have three outstanding engineers: a mechanical engineer, a process engineer, and a manufacturing engineer who help customers recognize how to make parts more economically. Engineering is finally a big part of what we do, as our name implies.”

Besides outstanding people, Salisbury has invested in new high tech equipment, which attracts new types of jobs. Mack Engineering’s new Maier and Star Swiss turning machines perform multiple operations to complete an entire job on a single machine. The shop has four other Citizen L-20 Swiss turning machines with sub-spindle, live tools, long work piece adapter and .750” capacity, as well as six CNC turning centers and four CNC machining centers.

These high tech machines contribute to the shop’s versatility. “We don’t really have a niche,” says Salisbury. “We probably should, but I don’t like that word. My feeling is that if we can satisfy more of our customers’ needs, they don’t have

to look for a different shop to do different kinds of work.”

According to Salisbury, the shop has practically reinvented itself in the past three years as they shifted from simple parts requiring two or three operations to more complex jobs requiring multiple-operation turning equipment. Mack Engineering is now a leader in CNC, Swiss, turning, and milling. They serve many industries including health imaging, consumer products, and hydraulics.

What’s next? For the foreseeable future, the shop will keep finding ways to work lean. “We’ve picked all the low lying fruit,” says Salisbury. “Now we’re getting into the hard stuff—total set up reduction, making sure all our programs are in place and our quality is at its highest. We’re using JobBOSS and it’s been critical to our success.”



Fast-paced and versatile, the shop recently expanded its use of Exact JobBOSS in order to work leaner as they take on more complex, high precision jobs.

With stiff competition from China for materials and jobs, Salisbury does not foresee easy times ahead. But there will always be new ways to work lean, innovate, and advance customer service. Being a risk taker at heart, she welcomes challenge. After all, the shop was founded sixty-two years ago and is still going strong. “The underlying goal is to embrace risk. Our mission is to innovate, stay customer focused, improve quality. Hopefully, we create a company that prospers for another sixty years.”

For more information, go to www.JobBOSS.com or www.MackEngineering.com – PM