Vericut

# King Machine

Growing Business Through Relationships, Customer Satisfaction and Technology

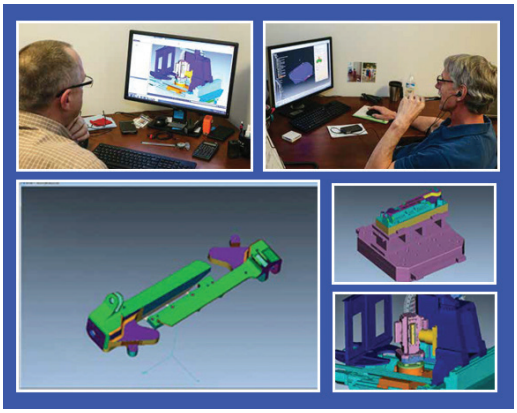
User Story

King Machine, LLC. has more than 30+ years of manufacturing expertise in the Pacific Northwest. The original owner started King Machine in 1978 and ran it until 2013 when he sold it to a group of local machinists wanting their own company. King Machine had always done aerospace work, but for older airplane programs that were drawing based, like the Boeing 747 and 767. They didn't have the ability to work effectively with newer, digital only programs designed in CATIA. "The company needed an upgrade in technology and tools to compete on newer airplane programs," explains vice president and general manager Dale Lyski. "The first thing we did after the sale was complete was invest in technology. We purchased CATIA, VERICUT and a Brown and Sharpe CMM." For Dale and his partners these were the bare bone necessities needed to compete in the current marketplace. King Machine was an attractive purchase because it already had a Boeing supplier code, ISO certification, and a quality system. This was the foundation needed to grow the company without having the added hassle and expense of starting from scratch. "When we took over on August 6th, 2013 there were 12 people working here with barely enough work to keep them busy. We now have 42 employees on staff and our sales have grown at a similar pace."

Dale and his partners all worked together for twenty plus years for a local privately owned machining business. That business was purchased by a private equity group, then sold again to large public company. "Going from a private, family run business, to a private equity, and then to a public company was a big transition," describes Dale. Within a year and a half of the last sale most of the management had left the organization and gone off to do other things. They took away a lot of experience and applied it here. Each of the partners has their own expertise, so there are never too many cooks in the same kitchen. Keith Mehus is the president of King Machine and was the general manager at the previous company they all worked. Dale handled the operations and engineering at the old place and continues to do so at King Machine. Rick Huffman is down on the shop floor as production manager, while Mark Henderson handles business development. Mark formed good

relationships with customers at the prior company and was instrumental in getting the ball rolling in the new direction at King Machine.

King Machine is primarily a milling shop, but they do mill-turn work when needed. “We don’t actively pursue turning only jobs,” tells Dale. “We focus on what we do best; high speed machining of large aluminum structures.” Structural aerospace parts for the fuselage, leading edge, trailing edge and wing fill up the 13 CNC machining centers in the 26,000 sq.ft. facility in Mukilteo, Washington. The first new machine added to the shop floor was a Matsuura MAM72-100H. It’s a 5 axis high speed horizontal with 240 tools and a 42” work envelope. They also added a Fastems cell with 20 pallets and two loading stations. “We sold out the capacity on the Matsuura rather quickly,” comments Dale. “So we added a second Matsuura MAM72-100H to the 20 pallet cell. The two machines share the Fastems system and there is room for a further expansion of ten more pallets and one more 5 axis machine.” Bigger isn’t necessarily better every time, and as the number of orders increased production manager Rick Huffman saw a need for a slightly smaller machine. “Not all the new orders were suited for the larger Matsuura 5 axis machines,” explains Rick. “To achieve better machining efficiency on some of the smaller parts we purchased a 4 axis dual pallet Makino a51nx horizontal to take up the task. We are near reaching capacity on that machine already, but are ready to add a second one next to the first.” The majority of parts King Machine produces are for Boeing Commercial. Since 2013 they’ve more than tripled the company’s statement of work. “Most of the parts we build ship to tier 1 Boeing suppliers,” describes Dale. “Our goal is to do more direct business with them in the future without sacrificing customer service to our existing customers.”



One of the first calls King Machine’s new ownership made was to CG Tech’s Scott Michalek. “Scott is the local VERICUT rep and we’ve known him forever,” tells Dale. “Our opinion is that VERICUT the best of its kind on the market, and it is a product our programmers have experience using. We’ve always had great success using it and can’t imagine using anything else. No investment in technology is complete without it.”
John Madison and Dave Jennings started programming with pencils on pads of paper back in the early 80’s. They are King Machine’s programming Gods and echo Dale’s thoughts about VERICUT. According to Dave, “With the complexity of modern aerospace components, and the speed of the machines it is 100% mandatory to have tool path verification to be able to do the work.” King Machine

uses VERICUT's machine simulation for all the machines and finds it especially useful on the high-speed 4 and 5 axis milling centers. They model every tool, every nut, every bolt, and every tombstone. "Not all the tombstones are the same," tells John. "They are different shapes with a variety of different fixtures and dimensions, so modeling them is essential to preserve the equipment. When you are rolling stuff around on 5 axis you have to be aware of everything. A pretty standard practice in the estimating department is to put a part on a machine that is a tad larger than the machine's work envelope. With everything modeled out on all our machines we will know right away if it is even possible. We can spin the machine around manually and confirm it is good to go."

Nothing touches any of the machines without going through VERICUT first. Operators at King Machine won't even run a part unless they are 100% positive that it was proved out in VERICUT first. "VERICUT gives us a lot more confidence in what we do," explains Dave. "It makes me a faster programmer because I know it has my back and will catch any errors no matter how big or small. It allows us to do things like be more aggressive on our rapid clearance planes without worrying about making a mistake that could cost time and money." VERICUT doesn't just assist the programmers, it instills confidence in the people operating and setting up the machines. "The guys in the shop never doubt that what we give them will work," continues John. "There is no trial and error only cutting on deliverable parts right out of the gate. The guys are doing setups on at least 8 part numbers a day. We would never be able to have that efficiency without using VERICUT."

Dave and John use VERICUT's simulation for more than just maximizing cutting paths. Creating inspection sketches and reviewing run time budgets are easily done right from the VERICUT software. "It takes only a few minutes to generate an inspection sketch," describes Dave. "Click on a few features and it documents the dimensions of those features. It not only notes the feature dimensions, but also notes which tool generated that feature. So for example if the wall is oversized the shop knows tool 25 made that feature. They can then inspect tool 25 to see if it needs replacement." When King Machine quotes a job and is awarded a

contract everything has a budget. Materials, outside processes, machine time are all based off the quote. John and Dave double-check those budgets by using VERICUT. “If estimating has 45 minutes in the budget, but our simulation proves out at 55 minutes we know to go back and see where the problem is. Sometimes the solution is to move it to another machine for better efficiency, but sometimes not. As programmers we always make it a point to beat the time given to us by the estimating department, and 90% of the time we do thanks to VERICUT.”

Going forward Dale, and King Machine’s goals are to fill the current machining centers to capacity and manage a consistent growth rate. “We have enough space to continue at this rate for another couple of years,” explains Dale. “After that we might need to expand on this site or find a larger building. When companies get larger they seem to let customer service falter. “We don’t want to do business like that.” King Machine focuses a lot of effort on customer satisfaction by supplying quality parts, on time, at the lowest possible cost. They take pride in actually answering the phone and email. “We are growing the business based on relationships and customer satisfaction,” concludes Dale. “We want to do business the right way. We have no interest in selling out to a larger company. We are committed to growing this one and being a high quality, high precision shop with unbeatable customer satisfaction.”

Article published in CNC West, April 2016 (PDF)