USER'S VOICE

Vol. 4

OKUMA
Computerized Numerical Controller OSP Series

● An OSP User Testimonial

"For the NC unit, OSP is everything"

In support of "Single Source Machine & Control" Manufacturing

● Development Story

A talk with the developers

Creating an "intelligent, user-friendly NC"

● The OSP Adds More Value

Three sound ideas based on user perspectives

Nakahara Seisakusho is a world leader in machining of guide rollers for newspaper rotary presses and other rollers. They promoted NC from an early stage, and gave us valuable advice for the development of OSP software. Chairman Kiyoshi Nakahara spoke with us about his experience with the OSP and his business philosophy.

Nakahara Seisakusho, Inc.
Kiyoshi Nakahara, Chairman
Address: 463 Otami, Okayama, Okayama Prefecture
Tel: 086-279-1221
Business activities: Roller processing and parts machining/assembly for printing machines, roller processing for textile machinery, parts machining for precision machinery

We sympathized with the goals of "Single Sou and "absolute position feedback" engineering the OSP's steady influence on advanced NC s

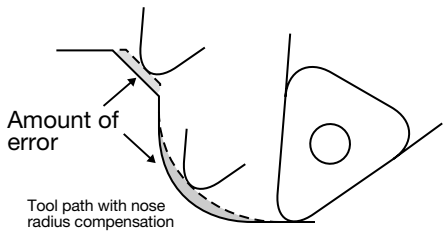
Products from an all-round machine tool builder who trumpeted "Single Source" manufacturing had a strategic advantage

Thinking that we were at the start of the NC age, in 1967 we bought a controller from a dedicated NC manufacturer. A short time after that we purchased an Okuma machine, which provided the opportunity for various discussions with Mr Yutaka Maeda (later Okuma's sixth president), general manager of the Electronics Department (currently the FA Systems Div). We agreed that machine tool builders should also develop NC controllers in-house — the "Single Source for Machine & Control" concept. We also agreed with the thinking behind the position command system. At that time most machines adopted an incremental system in which it was necessary to return to origin after the machine was turned on, but we insisted that an OSP with an absolute position feedback system, in which the machine remembers the coordinate positions even when the power is cut off, would be easier to use. Our feeling was that Okuma's ideas came straight from the machine shop, and we took an immediate liking to the OSP.

At that time there was much room for improvement in both Okuma's machines and NCs for roll machining. However, our take on the situation was that they were covering a wide range of machine types — lathes, machining centers, double-column machining centers, and grinders — and that if they had the technology to also develop NCs they would be able to handle our difficult requests in the future.

Nose radius compensation and numerous fixed cycles born from machine shop requirements

We are constantly thinking about how we can make the work we perform daily a little easier and more efficient. We would think, "it would be more convenient this way," or "couldn't we do this?", and came up with new ideas and requirements for the machines. We bounced our ideas off Mr Maeda or the engineers in charge, and went back and forth for numerous discussions, which sometimes lasted through the night. Through this give-and-take we came up with several new functions. For example, in 1972, before we could perform nose radius compensation we went through a troublesome calculation to compensate for the difference produced from the error between the radius configuration of the tool tip and the programmed tool path, and then punched the results into the tape. We wondered if we couldn't make a program in which the NC could compensate for this difference beforehand. The result was nose radius compensation and standardization.



OSP is adopted for the majority of machines on the lines for turning, multitasking, machining, grinding and other operations. Recently automation is progressing through the integration of processes and the introduction of robots.

Most products go overseas. Nakahara Seisakusho's precision roll machining technology has become essential for printing machines whether they are newspaper or offset.

OSP2200 still in use

rce Machine & Control,"
, and benefited from
ystems.

Similarly, in the fixed cycle for drilling deep holes using a parameter program, we developed a program so that chips would be cut up and not jam the drill as it advanced, and even collaborated on the practical application of this new design. We also made various requests for automatic programming (LAP, MAP) for lathes and machining centers. We were able to do this because our company specialized in machining and programming, and I myself created programs for about 50 machines. Familiarity with the entire operation makes it possible to see specific points for improvement in setup, machine movement, and programming. This is the same now as it was then. And because Okuma was a true single source builder of machine and control, they met tough machine tool requirements and produced a user-friendly controller.

More efficient production by integrating operations and reducing non-cutting time

We have a good array of equipment and machines, and it is not unusual for us to work on a piece over many processes and multiple machines without taking down the setup. In fact, we have 120 machines for 60 workers, so the machine operation rate is not high. However, I prefer to have a machine stopped to having workers stopped, so I think our current balance is just right.

We value even our old machines, and find a way through setup to make the best use of them. Today we still use an OSP2200 hooked up to an LH-N flat-bed lathe purchased in the late 1960s. We also have an OSP3000 in active service on a machining line. On the other hand, from the beginning we have continued to introduce new and powerful machines, spending about 200 million yen each year. Our thinking is that introducing a new machine is the same as introducing new technology.

During busy times, our workers help out other divisions, and inevitably acquire a range of skills with various technologies. However, we put emphasis on machine efficiency rather than manpower, so that night shifts are not necessary and there are no unnecessary personnel expenses. With this approach we have not once operated at a loss in our 55 years in business.

My sons who will succeed me in the business feel that success will depend on operating multiple machines without human operators. They are now working to integrate operations with autoloaders or robots, enhance multitasking lines, and move from uniform management by computer to Okuma's MacMan (machining management) production control systems. Recent products with the Thermo-Friendly Concept as a measure against thermal deformation are outstanding, but in the future I look forward to improved and enhanced functions and products that will delight machinists in the shop, like reducing non-cutting time even more.

Interviewed by Atsunori Sakamoto

User Perspectives

Okuma engineers comment on users' experiences

— The OSP in retrospect —

Hiroyuki Fujii (Soja, Okuyama Prefecture)
President, Soja Kogyo, Inc.

We trust Okuma's high quality product support, from installation of the machine to proposals for applications and after-sales service

Our company mass produces parts for automobiles (engines, transmissions, suspension, etc.), air conditioning equipment, hydraulic equipment, and other products. We have purchased machines from Okuma since 1977, and in that time have experienced their excellent and wide-ranging support, from start-up before installation of the machine to follow-up service. For example, their engineers came down and worked with us for start-up of "semi-dry machining" for continuous variable transmission (CVT) parts, and recently they suggested a tool breakage detection system by no-load monitoring of the spindles on machines. We are especially satisfied with their service handling for single source for machine and control during production line stoppages. Some of our staff who write programs know OSP well have said that it is easy to use—editing in the E-series is especially simple—but that it would be helpful to have a pop-up that could be called up quickly when they want to see the spindle load, for example. What we ask for from Okuma is not high-level specifications, but rather a simple controller specialized for the mass producer.

Okuma offers applications that reduce the number of operations – which also benefit mass-produced parts requiring highly-accurate, complex machining

Soja Kogyo received the Science and Technology Agency Director-General's Award in 1984 for their line-type transfer machine device. More recently, they have been awarded for the joint development with a certain manufacturer of a new type of tool for scroll machining. They put much effort into the development of advanced applications. The semi-dry machining mentioned above produced major results in terms of both environmental measures for ISO 14001 activities and reduction of cycle times. Okuma proposed a method for creating programs with reverse side chamfering for angular holes, which is shown in Excel for difficult tool paths. By providing such machining technology and detailed handling following machine start-up, we want to continue delivering the advantages of Single Source for Machine and Control applications. (Takanori Matsuura)

Hideo Takahashi
(Kyowa-cho, Makabe-gun, Ibaraki Prefecture)
President, Kyoritsu Seisakusho, Inc.

Full use of OSP macros dramatically streamlines spool machining for hydraulic equipment

Hollow spools are skewer-shaped spools that move inside a cylinder and change the oil flow path or open and close the flow. At the time of OSP5000, to improve production efficiency while allowing for high-mix, small-lot production, we used the enhanced OSP macro code, patterned outer diameter, overall length, and position of the oil groove in the workpiece to prepare an interactive program. This was a step toward achieving 40% of the world market.

When I was in university I studied position control of servomotors, but when looking at absolute position detection and macro-language I came to understand the thinking on the production floor, where people are trying to reduce non-cutting time and raise efficiency. We recently purchased and are using machining centers such as the MB-V and MB-A with OSP-E controllers to machine piston pumps for construction machinery. We hope to see Okuma develop support technology using IT to minimize machine down time resulting from breakdown.

The Okuma Engineers

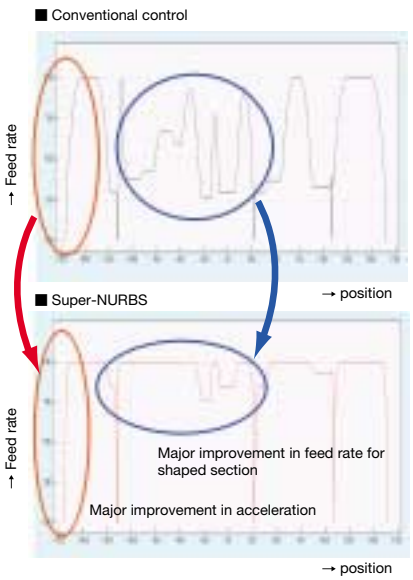
Takanori Matsuura Okuyama Sales Office, Osaka Branch
Katsunori Kunimitsu IT Plaza Group, IT Products Dep
Naruji Hatanaka Software Engineering Group 1

Improved die/mold quality with Super-NURBS and universal spindle. Expecting results from technology that prevents collisions and improves efficiency.

Yoshihiro Inden (Anjo, Aichi Prefecture)
Managing Director & Machinery Department Manager
Toyotomi Kiko Inc.

We use Okuma's MCR-BII and MCV-A to machine press dies for automobiles. We first encountered the OSP 16 years ago, when copying was the main practice and the picking amount was 5 mm. Because of this, finishing after machining took a lot of time. Later the machined surface quality was dramatically improved, first to 1 mm with Okuma's DMS (die manufacturing system) and now, with the current Super-NURBS, to an accuracy of 0.4 mm.

Today under the slogan, “Completing Dies on the Machine,” we are working to further improve quality.



Before/after Super-NURBS (Finishing time 1/2)

The degrees of freedom of the machined surface with the 5-axis B/C attachment has changed our concept of die/mold design. Slope machining that was not possible with previous double-column machines has allowed us to reduce the number of machine parts and shorten machining lead time. However, even though we conduct an interference check in the CAD design stage, preventing tool interference due to human error or other factors still requires many work-hours. We are therefore looking forward to the early release of the Collision Avoidance System.

In the future we would like to see more of this kind of “technical exchange meeting,” where we can exchange opinions and say what we are looking for in machines.

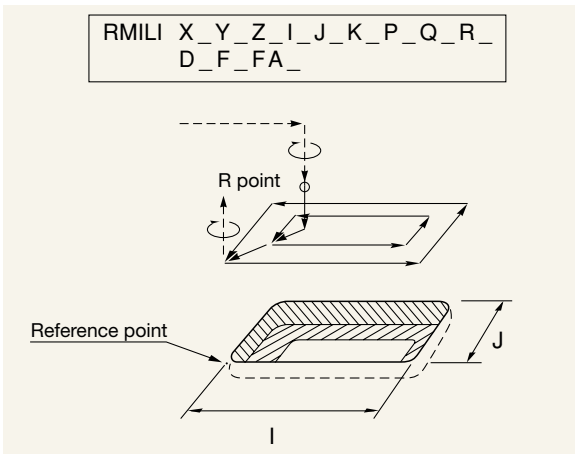
Toshio Miyajima
Project Manager, Design Control Office

With the worlds’ first Collision Avoidance System and other features, Okuma responds to needs for new technology with original in-house control systems

Super-NURBS allows users to always realize the designated accuracy even when the feed rate is changed. This results in better die/mold machining with great time savings. In addition, with “machine bending compensation” to reduce the unevenness from reciprocated picking, and quadrant Projection Flat Control (PCF-II) to prevent protrusion in the spindle return portion in arc cutting, we have focused on quality improvements incorporating feed shaft acceleration quality improvements for frequent die/mold operations. Moreover, to deal with the collisions mentioned between tools, materials, fixtures, and machine components that tend to occur during manual operation such as when changing setup, we have developed a new Collision Avoidance System (included in OSP-P200, see details on page 8) with which interference checks can be made online and collisions are prevented. This contributes to reduced machining preparation time and improved utilization rate. (Katsunori Kunimitsu)

Experience and enjoy advanced machining with enhanced automatic programming, fixed cycles, and macro-functions

Okuma made early efforts to simplify operations in order to reduce the program creation load and maximize machine operating time for our customers. Typical of these efforts are the automatic programming function (LAP) from roughing to finishing on lathes, and macro-functions (sub-programming call up) by G/M code and various fixed cycles for drilling and other operations. Kyoritsu Seisakusho has made excellent use of the functions of OSP, based on their high level of machining technology, which increases with every proposal for improvement in their operations.
(Naruji Hatanaka)



Programming example for area machining

User Perspectives

Okuma engineers comment on users' experiences

— The OSP in retrospect —

Junji Sakamoto (Hirakata, Osaka)
Managing Director, Sakamoto Kanagata Kosakusho Inc.

Twenty-five years ago we established die/mold machining technology in a company-wide project. From that experience we have continued to take up the challenge of cultivating next-generation technology.

Around 1980, we wanted to set up die/mold manufacturing using machining centers, and made a list of the functions to which NC should be applied. We brought these proposals to several companies, but development at each of them faltered. Okuma then expressed a determination to put their full company effort into this. We picked out several hundred technical issues, and both spent much time on this. Our companies had lengthy discussions and Okuma focused on developing the functions necessary for die/mold manufacturing. The result was the OSP5000, and the many functions they developed at that time — large program operation function, corner automatic override, and pulse handle interruption, among others — have become the basic functions essential for die/mold manufacturing today.

Okuma's current standing in this sector owes much to the persistent efforts of their engineers at that time.

The OSP5000 was crucial in our entrance to the world of die/mold manufacturing, and we are grateful for the efforts of others in developing the basic technology

It is no exaggeration to say that Sakamoto Kanagata Kosakusho is the father of the OSP5000 and plastic die/mold machining equipment. President Sakamoto had the vision to look not at what can be done now, but at what will be done in 10 or 20 years. To approach that vision of the future he has been uncompromising in his demands for accuracy and has given us valuable advice. His requirements for machines on which the tool moves 1 mm whenever the pulse handle moves 1 mm, and for machines that are insensitive to (not affected by) temperature changes were used in the development of our highly accurate position detection technology using AbsoScale and the Thermo-Friendly Concept. We now want to move closer to the realization of his idea that true adaptive control technology is not simply automation, but "autonomic" production in which the machine itself makes judgments.

(Masayuki Sugie)

Shiga Factory producing die/molds for automobile parts

The Windows® format is easy to use even for beginning machinists. The machining examples at okumamerit.com are also useful.

Fumio Suzuki (Hamamatsu, Shizuoka Prefecture)
Manager, Engineering Dep Ogusu Industry Co., Ltd.

Yoshinobu Hori
Assistant Manager, Engineering Dep

Our main business is mass production of products for automobile powertrains. Half of our NC units are OSP and half are from dedicated NC makers. We have noticed recently that the OSP operating screen is very similar to that of a personal computer, and very easy to use. For newcomers to NC in particular, the Windows format is familiar and they can quickly understand and remember the tasks shown on the screen. In addition, Okuma's "okumamerit" website* introduces useful machining examples and real-world macros.

On the other hand, the instruction manual is overly technical and difficult to understand, although this is also true of

The Okuma Engineers

Masayuki Sugie Manager, IT Products Dep
Reiji Sato Elemental Technology Group, Research & Development Dep
Hiroshi Oyama Software Engineering Group 3

Consulting the maker of single source for machine & control gives us confidence. Recently we have been impressed with the Thermo-Friendly Concept.

Starting with an LA lathe (OSP2200) we purchased in 1972, we began to link multiple NC lathes with robots or measuring equipment in automatic machining lines for land and marine engine pistons, production lines incorporating loaders, or grinding lines for precision machining. Our shop has a lineup of successive OSPs. We have maintained a long relationship with Okuma because of our trust and faith in them, as the maker of single source for machine and control, for maintenance and consultation on line formulation.

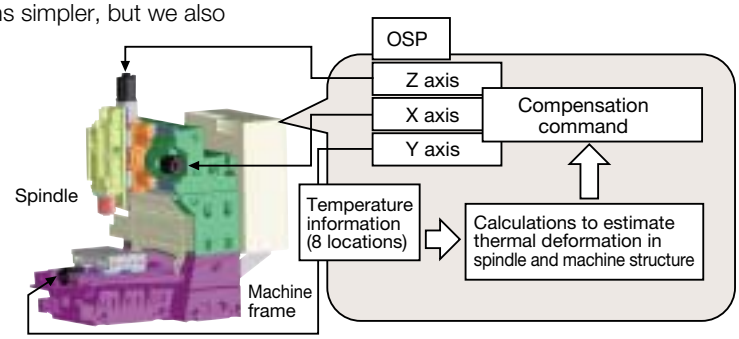
We recently purchased an MB-V and LB300, and our technicians have been amazed at the small thermal deviation and the spot on call up of dimensions. I am sure Okuma was able to accomplish this innovative technology because of their background in single source for machine and control. We at Sakai Tekkosho work in a range of fields, from mass machining of parts to prototypes of high-tech products. One thing I sense we have in common with Okuma is the spirit of continuously working to create new technologies.

Yoshimichi Sakai
(Kashiwazaki, Niigata Prefecture)
President, Sakai Tekkosho Inc.

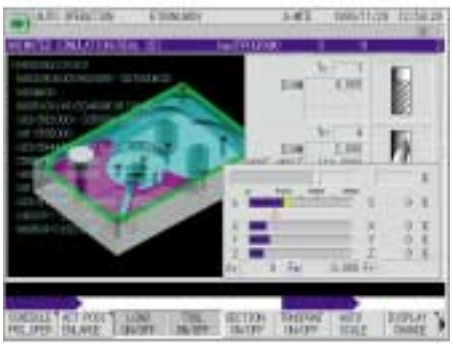
The Thermo-Friendly Concept was in fact born of "Single Source for Machine & Control"

The Thermo-Friendly Concept was realized from a combination of machine design technologies to make thermal distortion small and manageable, together with compensation (control) technologies based on very precise estimates of thermal deviation. The thermal deviation compensation system is a result of our heat analysis know-how for machine temperature and operating information, together with NC-based movement, so it really is a child of single source for machine and control.

We at Okuma of course want to continue making operations simpler, but we also intend to further develop NC so that the machining skills of special grade and first grade machinists such as those at Sakai Tekkosho can use it to maximum effect. (Reiji Sato)



Thermal deformation compensation system by single technology for machine and NC



← Novice operators benefit from easy-to-use pop-up windows

other companies. We think it would be convenient to have a digest version that gives specific explanations of the basic techniques for using the functions together with examples of applications, and also provide a simple summary of functions. We are now working to acquire ISO14001 certification, and we would like to have something that tells us about energy-saving operations in particular.
* http://www.okumamerit.com

Easy-to-use, intuitive operations reflect the voices of our customers. We will continue to endeavor to meet their needs.

The "intuitive operation" that links the OSP-E to -P series CNC systems is a reflection of the opinions voiced by people involved on the machining floor. The pop-up display function was made for easy, trouble-free operation even by beginning machinists, and includes instant appearance of the screen the operator wants to see with one touch, windows opening at an appropriate size and position with using a mouse or touch pad, and a function key for two-step pop-ups.

We also show examples of optimum cutter paths for contour and other machining of dies. In addition, Ogusu Industry Co. has given us valuable input with regard to dealing with instantaneous power outages from lightning storms, a theme that we will take up.
(Hiroshi Oyama)

OSP development story

As told by the developer

From the early days of the absolute position feedback system to the recent Collision Avoidance System, we have always put a priority on the people who will use the system in considering proposed OSP functions. Two engineers who were involved on the front line of that development talk about their passion for working on NC controls and the story behind the development.

Masayuki Sugie FA Systems Division
Asst GM, IT Products Dep

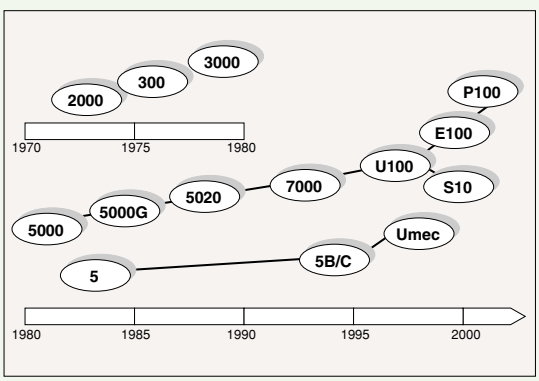
Masayuki Sugie joined Okuma in 1968 after graduating from the Electric Course at Ginan Technical High School. After working on servo controls and OSP1024 in our Research Department, he was involved in development of the OSP2200 and automatic programming (LAP) for lathes in the Electric Department. He has also worked on the development of OSP300, Okuma's first NC for the external market, loader system controls, and machining center software (OSP5000 series). Recently he has worked on the front line with customers in Service Dept. and experienced a stay in America. As an expert with direct front-line experience of the progress in NC, he is currently overseeing OSP operations.

Making the impossible possible through a collaboration between NC and mechanics not seen elsewhere

The joy of satisfying customers' needs through ever-advancing technical progress

I joined Okuma in 1968, just when NC controllers were starting to spread through the machining world. It was the age of the "hardwired NC" in which wires connected the elements. Electronics then developed dramatically, from softwired (computerized) NC, minicomputers, microprocessors, multi-main processors, and now networks and personal computer CNC. I feel deeply that being in the NC department of a machine tool maker has allowed me to experience a sense of accomplishment that I wouldn't have had elsewhere.

Okuma's mission is to always respond to the machining technology needs of our customers, and through these specific cases discover technical issues and develop our machining technology while searching for solutions. If just the NC is good, or just the machine is good, you cannot have a good product. Having both together and common know-how allows us to carefully analyze the machine and control and continue developing key element technology while putting together a harmonious system design. In this way we can begin to realize solutions for customers' needs.



Doing what could not be done before from in-house development of core technology

Okuma's approach is to develop what we need if it does not currently exist. For example, we developed an optical AbsoScale that we thought was essential for very precise position detection, devised a brushless motor to free its maintenance from the NC controller, developed a high speed calculation board, and were the first to use NC for the turret and ATC — there was no lack of problems for us to tackle.

It is perhaps our fast and accurate die/mold machining which most symbolizes Okuma's Machine & Control manufacturing. Free-form sculpturing at high speeds and quality requires machines that faithfully reproduce NC instructions — products developed from the pursuit of "extreme mechatronics."

We made proposals that delighted customers by making it possible for them to do what they couldn't do before, including bending compensation control for the feed axis drive system based on a highly accurate, highly rigid mechanics, quadrant Projection Flat Control, high speed contouring functions represented by Super-NURBS, CAD/CAM system development, and slope machining. This was one of the driving forces for the great support we received in the press die market. My work in die/mold manufacturing makes the biggest impression in my long technical experience, which for me summarizes the history of NC machine tools.

Intelligent NC for ease of use

If intelligent NC is understood to be development of technology that will reliably carry out a given command, one other major issue is technology that is easy to use. Okuma has provided various programming functions, animated simulations, and One-Touch IGF to make operations easier for operators, so that they can concentrate on the machining. Our Collision Avoidance System also provides relief from worry about collisions, and is a prime example of our integrated mechanical and electrical technology developed from the standpoint of the user. The ultimate form of NC machine tools may be one in which a drawing is input and the machines do everything without human workers, but until then we should always be thinking 10 years ahead to developing NC that is intelligent and easy to use.

OSP development story

As told by the developer

Katsunori Kunimitsu IT Plaza Group, IT Products Dep

Katsunori Kunimitsu joined Okuma in 1993 after graduating from the Electrical Engineering Dept. at the Nagoya University School of Engineering. For two years he studied basic manufacturing on an assembly line, and was in charge of the OSP-E100 graphics. Afterward, he was involved from planning to launch of the direct machining CAD/CAM system ADMAC-Parts. From 2002 he worked in product development using simulation technology, first sending a “3D Virtual Monitor” on-line, and in 2004 in the development of the world’s first Collision Avoidance System.

Collision-free machining — a dream since the birth of NC machine tools — brings peace of mind to all machine shops

Feel the unlimited possibilities of IT linked with 3-dimensional CAD

The first project I participated in from the planning stage was the ADMAC-Parts CAD/CAM system, where our focus was on the length of the machining preparation time on the floor. Our aim was to greatly increase efficiency with “direct machining,” in which NC data was prepared directly from CAD data to run the machine. Bringing a machining management function to the NC unit and tying it together with the production management system allowed the free exchange of machining information, and the NC program could be simulated on a personal computer. I won’t forget one amazing scene where I saw a customer connect it to a multitasking machine and get the machine to operate simply by tracing the CAD data. At that time I felt the unlimited possibilities of IT linked with 3D CAD.

Developing controls that take the worry out of machining

When we were going around to companies giving demonstrations of ADMAC-Parts, the operators had trouble dealing with the complex tool movements and programs, and collisions inside the machine became a big issue. In the design departments at big companies, however, they conducted part interference checks using 3D CAD, but were also seeking ways to use the data in downstream processes. While we were looking at their needs, we got the idea of software that could simulate the movement of the entire machine and conduct an interference check. The people who had worked on this before us had built up huge amounts of application software, and using that we were able to make a precise simulation that sent commands to the graphics screen rather than to the motor. This was the “3D Virtual Monitor” that made off-line interference checks and trial cuts unnecessary. However, even if this attracted attention in the CAD/CAM departments, many people on the floor were still uncomfortable unless they checked the operation once on the actual machine.

Skeptical customers finally show admiration

Seeing the reaction to the 3D Virtual Monitor, we became excited about making a “collision-free” machine on which this would be loaded rather than used offline. But we found that the height of the hurdles to be crossed for an offline simulation and real time control of the machine were different. This was because the program had to deal with the constantly changing shape of a piece as it is being cut, the complex movement of the tool, and movements that could not be predicted such as operation mistakes during manual operation, and then stop the machine immediately. We were fortunate because during that same year our engineers developed the OSP-P200, which combined OSP and Windows and had a calculation capacity 3 times that of the previous version. We put together this next generation control system, OSP software that had been amassed in-house, and mechanical technology to achieve our biggest goal — immediate shutdown by a real time OS.

Machine stops before interference. Trial cutting is greatly reduced.

Last fall at the Japan International Machine Tool Fair we launched our Collision Avoidance System, and large crowds of people came to see the machine (MULTUS) on which it was loaded. Every one of them looked skeptical. However, as they saw for themselves that the machine stopped dead no matter how many times there was a mistake in the operation, they began to voice their approval. Seeing the excitement of visitors made me feel sure we could provide a strong sense of security to ambivalent customers who wanted to bring in a multitasking machine but were worried about collisions resulting from operating mistakes.

Hiroyuki Ishiyama
(Chino, Nagano Prefecture)
President, Ishiyama Inc.

Soichiro Ishiyama
Sales Department Manager

Precision control and ease of OSP use are essential to high accuracy machining. We are evolving to make maximum use of that ability.

Our company performs high accuracy plane machining and parts machining for specialty machines. We have loaded and used a succession of OSPs from OSP5000 to OSP-E100 on a double column machining center we bought 20 years ago. OSP is easy to use whether in making a program using common variables or macros, or employing in a fixed cycle. Its pallet discrimination system variable also performs well in preventing operator mistakes. I think special workpiece samples such as the raised lettering of 3 microns done by a large double column machining center (on display in Okuma Techno Gallery) are also possible thanks to the Super-NURBS function. Fourteen years ago we purchased a DNC system to transfer NC programs, and it is still essential for us today.

One thing we often feel, however, is that the upgrade to a new generation OSP could be smoother. On one hand upgrades bring improved operability, but people who were used to the previous version can become confused by the new version. I would like Okuma to keep this in mind when making model changes. Other suggestions would be to have a split screen so that one side could be used for help or search functions while the program is being edited, and a function to call up subprograms during DNC operation even without pre-setup calls.

We always feel we would like to use the capabilities of the OSP more fully. So when Okuma improves functions and operability, we'd like them to also provide detailed and easily understandable documentation to help us take full advantage of these improvements. For example, we'd welcome a manual that includes program case examples and a glossary to help users make maximum use of the OSP.

Shozo Jumonji (Ota-ku, Tokyo)
President, Sekidai Kogyo, Inc.

Yasumitsu Nanjo
Manager, Manufacturing Technology Section

The user-oriented edit function helps us do trial runs requiring tight accuracies and deliveries

Trial production, whether for automobiles or home appliances, has increasingly strong demands for accuracy together with shorter turnaround times. Process design from drawings is key to responding to these demands, and usability of the NC unit is important. The OSP, which does not forget the position even when the power is cut off, is simply easier to use. At our company we have a special department for writing the basic programs, but owing to the operating characteristics of trial runs, minor revisions on the machining floor are not uncommon. However, since a single machine is often used for 2–3 processes, when we create programs for separate processes the file editing function is useful in editing two files simultaneously, moving program commands, and making simple copies. One-Touch editing in the OSP-E system is convenient because it allows the program to be directly altered on the operating screen, and another file selection operation is not needed.

High operating panels or poor switch arrangements can make people tired, and OSP takes those points into consideration. To increase machining efficiency we often transfer programs to machines that are not in use to continue the operation, and considering compatibility, the OSP naturally became the centerpiece of our configuration.

Efficiency is doubled by simultaneous editing of 2 files

The value our customers receive with OSP CNC systems

Okuma Corporation
Junro Kashiwa
President & CEO

Okuma's original NC controller, the OSP, was first developed in 1963, in the very early days of the period of high growth. Although this was 14 years after the development of the world's first NC machine tool at the Massachusetts Institute of Technology in the United States, NCs were still almost unknown generally and people who used machine tools were still called artisans.

Later, as the period of high growth in Japan was fully underway and a worker shortage became serious, NC machine tools spread rapidly. Among them, Okuma's OSP gave the greatest support to people on shop floors using these machine tools.

The reason was because Okuma considered the key role of the machining floor in making things, and we adopted three ideas from the viewpoint of the people using the machines.

Absolute position feedback system

Creating an absolute position feedback system that did not lose the position even when the power was cut off was a barrier in the early development of the OSP in terms of both technology and cost. We debated repeatedly about whether or not such a system should be produced. In the end, the argument was won by the engineers who said that forcing operators to set the zero point each time the machine was turned on was unacceptable for an NC made by a machine tool manufacturer.

Today absolute position feedback systems are common not just in the OSP, demonstrating that these past engineers were correct in their insistence.

Flexible software

Flexible software is planned with the expectation that customers will make changes in their operating methods and applications over the years they use a machine tool, and from the early stages advanced thinking went into the OSP.

Today personal computers are as common as many home appliances, and upgrading software is taken for granted. However, flexible software is based on the idea that the work of machine tool makers is to make NCs that can cope with the lifecycle of a machine tool.

Your Single Source for Machine & Control

When purchasing an NC machine tool, most customers do not think of the machine tool and NC controller separately. Rather, they assess it totally, from the functions and performance it displays to daily upkeep and maintenance and service handling when there is a problem.

To respond to these obvious needs, we maintain all the technical materials needed for NC machine tools so that customers can use our machines with assurance. This is shown in our Single Source for Machine & Control concept.

All three of these ideas arise from Okuma's unchanging intention to provide total assistance to people using machine tools on the shop floor. This approach allows us to come up with new technologies such as the Thermo-Friendly Concept and Collision-Free Machining that could not be realized without Single Source Machine & Control manufacturing, and to provide new value to our customers.

We will continue our utmost efforts to make the OSP a valuable asset to your business.

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