

Case Study

Total Retrofit, Service and Maintenance Support to a Bearing Manufacturer

Background :A manufacturer of Bearings for Automotive Industry has several hundred machines with older CNC controls and servos. The factory is more than 25 years old. The demands for better accuracies and tighter tolerances on bearings are steadily growing.

The production department was always complaining of lower productivity on account of higher down time. The maintenance department wanted spares for electronics that was getting obsolete very fast. The cost of maintaining the older controls was much higher compared to buying new controls with latest technology. The management of the company had an option of buying new machines and scraping old machines and controls.

The customer has a very good maintenance team. However using the same team for retrofit activity would have put strain on scanty quality resources. The management made an obvious choice of retrofitting the machines with newer controls with excellent hardware and technology from Siemens and Integration Services of a competent company that knows what Retrofit activity demands.

Customer Requirements : The customer approached Logical Solutions for help. A meeting with the management and engineering team of the customer highlighted the following requirements:

- 1) Customer wished to use the “OLD IRON” as the mechanics was in a good shape.
- 2) Logical to take up total responsibility of Engineering support and prove-out of retrofit activity
- 3) Controls offered should be from Siemens.
- 4) The retrofit activity has to be carried out “ON SITE” within a specified time limit only, as the working machines can not be taken off production for more than a week.
- 5) The customer was to carry out mechanical reconditioning on a case to case basis.
- 6) Logical to provide maintenance and service support for all the machines with Siemens controls. Some machines were newly purchased by the customer from global suppliers.
- 7) The customer was to build some low cost automation systems for Quality Check as well as bearing assembly. Logical was to provide technical support for these in house projects also.
- 8) The customer required service support for more than 50 machines and development of control system for more than 25 machines.

Our Response : Logical Solutions took up the challenge of the customer and outlined the scope of work as under :

- Working closely with customer and Siemens for feasibility study
- Identifying the hardware architecture and mechanical condition of the machine
- Initial documentation and application Study
- Project Management and 'as built' documentation
- Electrical Control Panel design & manufacturing (Electrical CAD)
- Interfacing of Panel with Field elements
- PLC & HMI Software development, CNC Part Program & Cycles development
- Mechatronics Support during all stages of a project
- Procurement, Testing and Supply of hardware
- Commissioning and prove out
- Training and Hand over to the customer personnel

Mutual Benefits : The long term association with this customer has proved mutually beneficial for both the parties involved. The gains are numerous, a few of them are listed below :

- 1) Logical developed applications from ball manufacturing to assembly and testing, building a knowledgebase. The customer found an excellent and trusted System Integrator and service support
- 2) Customer benefited from use of Siemens hardware that reduced the variety and cost of service spares. Their maintenance staff developed hands on skills reducing dependency on vendor for service support
- 3) Since Logical believes in supplying most cost effective control systems the ROI for most projects was less than a year. As a result Logical gets repeat business from the customer even today.
- 4) The customer benefited by limiting capital expenditure on modernizing the machines. Hardware removed from retrofitted machines was used as spares for other machines with similar older controls
- 5) The feed rates and accuracies on most CNC machines were much more improved resulting into higher productivity, lower rejection and increased up time.
- 6) The older control systems had no provision of Marposs integration resulting into only Sizematic Operation of the machine. Logical proved that with development of Special Grinding cycles a cost effective control such as 802D/C can be used for Gaugematic operation of a bore grinder.
- 7) The customer did not have to ship the machines out of factory, saving effort, time and money. Logical had a quick turnover treating each retrofit as a mission critical job.
- 8) The customer has developed faith in process of retrofit saving them huge amount of money to be deployed for buying critical equipment for quality improvement. Logical got an opportunity to work at other factories of the customer.
- 9) Customer needs to spend lesser time with Logical on any new grinder. Logical has developed expertise in Internal grinding

Work Carried out so far: The following types of machines were taken up for electrical retrofit in a phased manner over several months

Sr. No.	Machine make & Function	Siemens Hardware Supplied	No. of Machines
1	Ball grinding mill	DC Drive 6RA20	1
2	Heald Make 1CF91 Bore Grinder	Sinumerik 802D based system with Marposs Integration	3
3	Cimat make Bore Grinder	Sinumerik 802C based system with Marposs Integration	3
4	Bryant make External Grinder	Sinumerik 810D based system	1
5	Voumard make Bore Grinder	Sinumerik 802D based system with Marposs Integration	1
6	Cimat make Bore grinder Servo Motor and Drive replacement	Interface of Simodrive 1FT5 motors and 611A with Num controller	3
7	Heald Make Bore Grinder	Sinumerik 810D based system with Marposs Integration	1
8	CNC based indexing mechanism for bearing cage punching on a press	Sinumerik 802D based system	1
9	Greishaber make superfinishing machine	S7 300 + OP 77 based control System	1
10	Supfina make honing machine	Induction Motor + Gear Box+ Micromaster VFD	1
11	Thielenhauss Make Superfinishing machine	S7 300 + Sinumerik 611U + 1FK7 servo	1
12	M-Stanza make high speed punching machine	S7 200 based controls as replacement of S5 115U based PLC	1
13	Needle Filling, Low cost pick and place pneumatic assemblies for pick and place, assembly & testing	S7 300 based control system with OP 73 and OP 77	4
14	Cage Turning machine	Micromaster and Logo	1

Our Promise :

- 1) A customer centric approach to doing business
- 2) A unified approach to Retrofit activity from Mechatronics to after sales service
- 3) An extremely cost effective package of hardware and services ensuring faster ROI

LOGICAL AUTOMATION SOLUTIONS, Inc.

15, Farmingdale Dr., Parsippany, NJ, 07054

e-mail : info@logical-as.com