ROBOTICS IN FABRICATION :
A MEGA LEAP IN TECHNOLOGY

PLAZMA

CIMOTEC HYDRO MACHINES (P) LTD

A Small Scale Industry is an ISO 9001-2000 certified company, engaged in the manufacture of medium / heavy fabrication catering to multinational manufacturers such as Otis Elevator Company (India) Ltd., Ingersoll-Rand (India) Ltd., Tetra Trucks (India) Ltd., Tracktech International Ltd., L.M. Glasfiber India Ltd., APW President Systems Ltd., Westfalia Separator India Ltd. and SAB Wabco Limited.

The company, until recently, relied heavily on skilled labour for producing precision products like weld fixtures, templates, drill jigs etc.
The manual operations put high stress on the resources to produce consistent quality to meet customers' requirement and thus win confidence.

No longer can cutting be the first of the many operations to be performed on a component. Severe cost cutting pressures necessitate that the divide between cutting and machining be extremely small. It is now imperative that the final qualities of the cutting process be as close as possible to machining tolerances.

THE PLAZMA ROBOTIC SYSTEM PRODUCTION ANALYSIS

The Robotic Plasma cutting system developed by M/s. Plazma – Pune is the first of its kind in India. Recently this system won the best design CMTI-PMT award at IMTEX'2004. At Bangalore plant of CIMOTEC, the system is carrying out two shift production.

Plasma is a state of matter achieved by the ionisation of gas at high temperatures to conduct an electric current. Focussing the current by means of an electrode and nozzle results in a beam of high intensity. The reference gas in this case is air, which is freely available. The basis of selecting a plasma source for cutting was primarily considered due to the fact that the cutting speeds compared to oxy gas cutting is faster (at least 3 times).

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Laser cutting was not a viable option as the price was prohibitive and cutting of material beyond 12mm thickness with a good edge is not attainable by laser. Coordinate table with either oxy gas / laser is common which can cut on two axes only.

Following are the jobs which were of high critical importance:

a. Port holes opening on Hydraulic Tank meant for Ingersoll-Rand India Ltd.,
b. Side walls of channels used for Truck chassis meant for Tata Trucks Ltd.,

The process was very slow, resulting in low volume of production. 11 operators were employed to make 5 sets of chassis over a period of 1 week (1 set comprising of 12 channels). With Plazma Cutting, the company now produces 15 sets of chassis with 4 persons over a period of One week.

Besides this, bevelling was done on plates most of the time for weld preparation which was made either by using a hand torch or milling machine. The hand torch method resulted in bad finish and uneven bevelled edge.

On the other hand the milling machine gave an excellent cut edge but the time taken and cost involved were both very high. By the use of Robotic Plazma machine, a high cut edge finish was achieved in shortest possible time. Recently a number of export jobs were completed with the desired quality within the specified delivery schedule.

The PLAZMA Robotic Cutting System is capable of:

a) 3D Cutting of formed components and welded assemblies
b) Contour beveling for weld edge preparation
c) Positioning speeds of 20 Meters /minute
d) Cut Speeds of 9 meters / minute
e) Cutting of Small Batch Quantities
f) Minimum Cut Accuracy Of +/- 0.5mm
g) 3-side accessibility for Job Handling.

PLAZMA machines combined with Robotics are capable of 3-dimensional cutting which results in huge savings and productivity. PLAZMA Robotics Systems also provide the flexibility for batch manufacturing to supersede mass manufacturing. It is now possible for cimotec to beat larger competitors, by providing just in time batches of assemblies instead of large scheduled supplies.

PLAZMA Robotic System supplied by PLAZMA Cutting Equipment Pvt. Ltd.,
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