

CO₂ WELDING TECHNOLOGY IN INDIA

By T. V. S. Sastry

Chairman and Managing Director, Bharat Earth Movers Ltd. Bangalore

(Inaugural speech delivered on the occasion of the National Welding Meet, July 16, 1994 at Bangalore)

It gives me great pleasure to be associated with this National Welding Meet organised by the Bangalore Branch of the Indian Institute of Welding and I thank the organising committee for giving me this opportunity to share my views with the welding professionals of this country. I must compliment the organisers first, for having selected the most appropriate subject as theme, viz., "Continuous wire welding processes with CO₂ shielding" and then for having chosen Bangalore as the venue for this Meet.

In the recent years, Bangalore is fast becoming the centre for establishment of many welding industries associated with MIG/CO₂ welding and Flux-cored Arc welding. Steel producers, welding wire producers, welding equipment manufacturers and welding gas suppliers have all established production base in and around Bangalore. Major users of continuous wire welding processes like BEML, L & T, WHEEL & AXLE PLANT, are situated in this city. I understand that the Bangalore Chapter of Indian Institute of Welding is very active. The zeal shown by the members of this chapter by organising this meet and providing an interactive forum for the industry to analyse the strengths and weaknesses of Indian Welding Industry and also to provide direction and guidelines for future growth is highly laudable.

At this juncture, I feel it is appropriate to share my company's experience with all of you. With a sense of pride and satisfaction, I can state that Bharat Earth Movers was the first Public Sector Industry in our country to have changed over to large scale application of CO₂ welding, more than a decade ago. In BEML, about 80% of the total welding is carried out by solid wire CO₂ and flux-cored Arc welding process. The three manufacturing units at

Bangalore, Mysore and KGF annually deposit around 250 Tonnes of weld metal by these processes. About 300 semi-automatic CO₂ welding equipments are installed and over 500 welders are trained and qualified in working with these processes. Most of the welders are certified by external agencies of repute like BVQI, TWI (The Welding Institute, U. K.) and WRI (Welding Research Institute). Centralised liquid CO₂ bulk storage facilities and pipeline distribution network for CO₂ gas have been established in these units.

In addition, as a measure of major technology upgradation, a computer controlled arc welding Robotics system has been installed at our Mysore complex. The system consists of two articulated Robots with 6 degrees of freedom with a working envelop of 25 meters by 5 meters. Welding of dumper body and other earth moving equipment structural members has been established using these Robots. This is perhaps the first major application of Robots for welding in this country.

With the experience we have had in working with these welding processes for over a decade, I would like to place before this august body a few points, which the learned members and delegates would like to deliberate in detail and come out with suitable recommendations and directions for the Indian Welding Industry.

First let me consider the welding equipments available in this country. 5 Indian companies are engaged in manufacturing of these welding equipments. But most of them are utilising technology which is fast becoming obsolete. The present trend all over the world is to use "Inverter" power sources. These are highly energy-efficient, very compact and occupy very little of the precious shop

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floor space. Synergic MIG power sources with single knob control are in vogue in many countries. These equipments have enhanced the position welding capabilities and have totally eliminated spatter during welding, to produce high quality welding.

Electronic controls have made it possible to have wire feed systems with digital displays where the arc voltage and wire feed speed can be set and automatically maintained throughout the operation, irrespective of the fluctuations in the input supply voltage. It is also now possible to present six different sets of parameters for different applications and lock the same by the welding engineer. The welder has only to select the appropriate preset conditions. Such systems have simplified surveillance and monitoring of the actual welding job.

The Indian Welding equipment manufacturers should strive to make such equipments available to our users at reasonable prices.

There is also a greater need to make available light weight torches with better thermal insulation materials, keeping in view the physique of Indian welders and the tropical climate.

It is reported that in India, the share of solid wires and flux cored wire is only about 10% of the total weld metal deposited, whereas in Japan it is about 60-70%. It goes without saying that while a few large industries like BHEL, BEML, L & T, ICF, HM have adopted large scale use of these processes, considerable efforts have to be put in to popularise these processes in medium and small fabrication industries. The major deterrent for many users in adopting these processes has been the high cost of Argon-CO₂ gas mixtures and flux-cored wires in India, which offsets the productivity gains and savings in labour cost. In Japan, the use of 80-20 Argon-CO₂ gas mixture is a standard practice in most

fabrications involving even carbon steel. This is rendered possible by the abundant availability and relatively low cost of 80-20 Argon-CO₂ gas mixture.

In Japan and U.S., flux-cored wires have taken the place of covered electrodes and solid wires in many fields of application due to its superiority in welding productivity derived from higher deposition efficiency, excellent usability and weldability. While in Japan and U.S., the cost of flux-cored wire is about 2-3 times compared to solid wires, in India, it is around 4-5 times the cost of solid wire. The flux-cored wire manufacturers should strive to develop the steel strips and other raw materials within the country so as to achieve drastic reduction in the cost of flux-cored wires.

I am pleased to note that this Meet is going to discuss the requirements of welding as a "special process" which forms part of "Process control" clause of ISO:9000 quality standards. In this context I would like to bring to the attention of the forum that the quality assurance standards demand that fabricators establish calibration programmes covering welding equipments. However, very little guidance is available as to how different types of welding equipments are to be calibrated, particularly for manual and semi-automatic applications. In these processes, the instruments are coarse setting up indicators and fine tuning of the parameters is left to the choice of individual welders. This forum may discuss the subject at length and come out with agreed guidelines on calibration of welding equipments.

With these observations, I have great pleasure in inaugurating the National Welding Meet and I wish the organisers all success in the conduct of the Meet and to the delegates a very purposeful interaction and exchange of knowledge and information.

Thank you.

Dear Members,

You are requested to remit the Annual Subscription for renewal of your Membership, if not already remitted. This is just to remind you.

Editor--IWJ

ANNUAL GENERAL MEETING

28th Annual General Meeting of the Indian Institute of Welding was held on Monday, 26th September, 1994 at the IIW Hall of the Headquarters premises at 3A, Loudon Street, Calcutta 700 017. Dr. Placid Rodriguez, President-IIW acted as Chairman for conducting the meeting.

The Office- Bearers and Council Members duly elected for the year 1994-95 is given below.:

President

Dr. Placid Rodriguez

Past Presidents

Mr. V. G. Jagannath

Mr. A. K. Basu

Vice Presidents

Mr. J. K. Nanda

Mr. S. K. Burman

Mr. M. L. Gehani

Hony. Secretary :

Mr. K. K. Tandon

Hony. Treasurer

Mr. A. K. Kundu

*Members Representing Fellow/
Member/Associate Member :*

Dr. S. Prasannakumar

Mr. Anupam Haldar

Mr. H. C. Gullati

Mr. M. P. Dhanuka

Mr. G. D. Garg.

Members Representing Industrial Corporate Members

ESAB India Ltd, Bombay

Mr. Ashis Mukerjee

Wheels India Ltd, Madras

Mr. V. Vijayaraghavan

Welding Research Institute, Tiruchirapalli

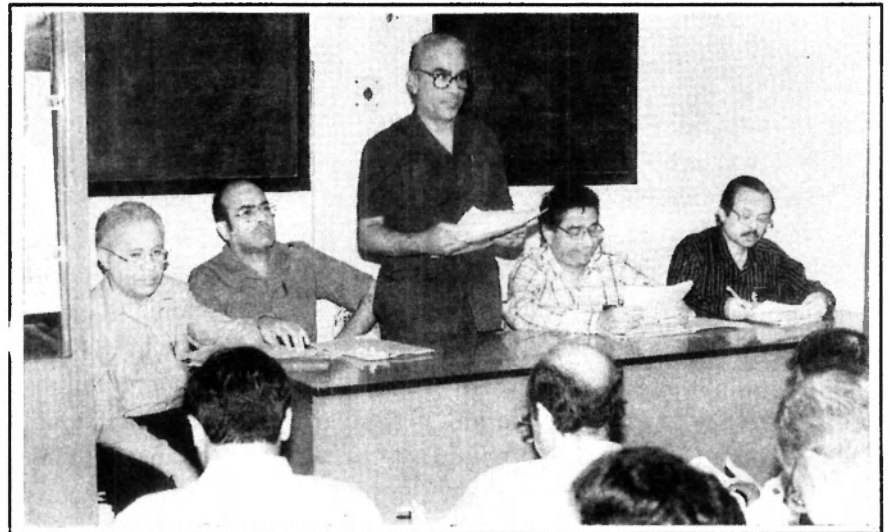
General Manager

Sur Iron & Steel Co. Ltd., Calcutta

Mr. J. K. Sur

Miraj Electricals & Mechanical Co. (P) Ltd., Bombay

Mr. M. Ismail



At the 28th Annual General Meeting of the Institute on 26th September 1994 at Calcutta (L-R) M/s M. L. Gehani, S. K. Burman, K. K. Tandon, Placid Rodriguez and J. K. Nanda

BRANCH NEWS

CALCUTTA BRANCH

- a. On 22nd July, 1994 one day course on "Welding Technoplogy" was organised at Andrew Yule & Co. Ltd., Calcutta at its Kalyani works. The course was sponsored by Andrew Yule Co. Ltd. and attended by Managerial Staff of the Company.
- b. On 23rd July at 3 p.m. a film show was arranged on "Advance Welding Process."
- c. A three day training programme on " Prodctivity and cost effectivness of welding Process" was arranged. This training programme was sponsored by Bridge & Roof

Branch News

Co. (I) Ltd., Howrah works and was attended by shop floor level. Supervisors & Welders from this organisation.

- d. The Annual General Meeting of the Branch was held on 23rd July, 1994 and the following office-Bearers were elected for the year 1994-95.

Chairman :

Mr. A. K. Mukherjee

Past Chairman :

Mr. S. K. Burman

Vice Chairman :

Mr. S. K. Gupta

Mr. R. R. Bhattacharjee

Hony Secretary :

Mr. M. K. Biswas

Hony. Treasurer :

Mr. A. K. Bose

Members :

Mr. B. K. Misra

Mr. S. K. Ghosh

Mr. Anupam Haldar

Mr. J. C. Shahani

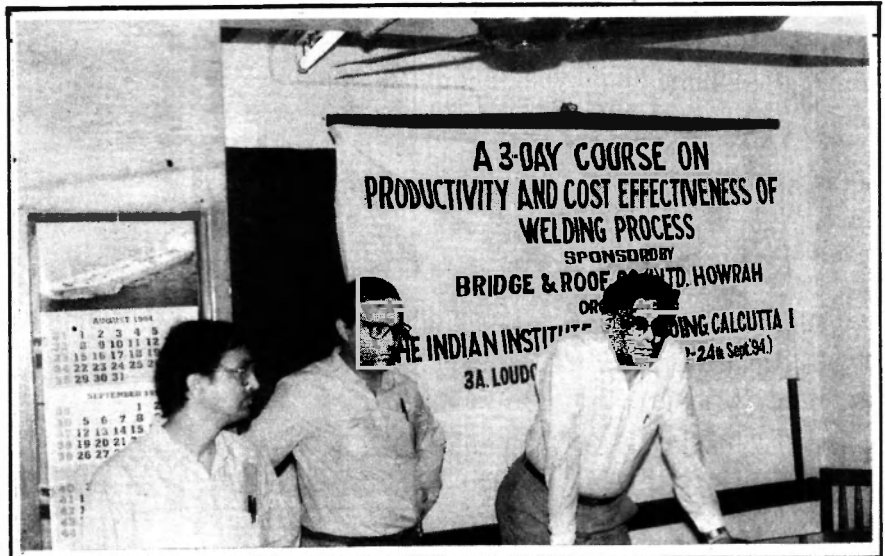
Dr. T. K. Pal

TIRUCHIRAPALLI BRANCH

Three technical talks were arranged by the Branch at the IIW Hall during the period April - May 1994 in association with sister professional body ISNT. The talks were as follows :

April 5, 1994

Dr. Ing Heinrich Kostermann Di-



At the three day course on "Productivity and Cost Effectiveness of Welding Process" - Calcutta Branch (L-R) M/s A. K. Bose, M. K. Biswas & A. K. Mukherjee

rector, SLV, Hannover, Germany - Topic "Welding Education and Examination in Germany and Europe" (Jointly with ISNT.)

April 7, 1994

Dipl. Ing Karl Heinz Fischer Manager, NDT, Materials & Testing Department, SLV, Dutsburg, Germany. Topic- "New European Standard EN 473 - Qualification & Certification of NDE Personnel" (Jointly with ISNT)

May 4, 1994

Prof Dr. Klaus Roessler GTZ/Long Term Expert/WRI. Topic - "Development, properties and application of High Strength Steels."

EVENT

A special function was got up at IIW Lawns on the evening of May 6, 1994. The occasion was to felicitate and bid fare well to Sri S. K. Mazumder, Founder Secretary of IIW, Truchirapalli Branch,

who after retirement on superannuation from BHEL, Trichi was moving his residence to his home town at Calcutta. The function was well attended by the Branch members along with spouse, and the functions reflected the true love and affection of the Branch members to Sri Mazumder, who was been the heart and soul of several activities of the Branch right from the days of its inception.

JAMSHEDPUR BRANCH

The Annual General Meeting of the Branch was held on 2nd July and the following Office Bearers were elected for the year 1994-95.

Chairman

Mr. B. K. Singh

Vice Chairmen

Mr. G. Mukherjee

Mr. R. G. Rao

Dr. J. Jain