Fourth Annual General Meeting

The Indian Institute of Welding Presidential Address

By K HARTLEY

When we met last year for our Third Annual General Meeting, I mentioned that the economy had begun to pick up and that the real problem facing us was the political uncertainty then prevailing in many parts of the country.

Since then there has been a fairly steady revival in the economy but regrettably another constraint has imposed itself on the growth in the engineering industry —I refer to the serious shortage of steel that has recently developed. This is not only hampering production for the internal market but is also slowing down the expansion of our export trade of engineering goods, the phenomenal rise in which between 1967/68 and 1968-69 suffered a setback in 1969/70 as will be evident from the following figures :—

Year	*Value*	*% increase*
1967/68	Rs. 41 crores	—
1968/69	Rs. 85 crores	105
1969/70	Rs. 106 crores	23

One of the reasons for this setback is the shortage of steel generally and of certain special categories of steel in particular.

Steel shortage

Welding is very closely linked with the engineering industry and the fortunes of the latter have a direct, inevitable effect on the welding industry. While production of electrodes, for example, has improved as a result of the greater activity in the various sectors of the engineering industry the increase has not been as rapid as it would have been had there been no shortage of steel. The production of arc welding electrodes, which dropped to about 18 million metres in February 1967, rose to nearly 21 million metres in December 1967 ; by November 1969 the figure had improved only marginally to 22 million metres and the average monthly production in the first quarter of 1970 fell to 18 million metres. This was due not merely to the general steel shortage but also specifically to the shortage of electrode quality steel.

The shortage has become so serious that the Government has decided to import steel of various categories including special steels but this is far from adequate. The Government is now planning a major expansion of the steel industry. At a Press Conference held early this year in Delhi, Mr K C Pant, then Minister of State for Steel & Heavy Engineering, stated that estimates of the steel demand for the next ten years would necessitate a doubling of the country's capacity by the end of the Fourth Plan. To achieve this rate of increase one new two million tonne plant would need to be set up every two years ; accordingly the Government has already drawn up a programme for an additional expansion of one million tonnes for Bhilai, action on the second stage of Bokaro, production of stainless steel at Durgapur, 100% increase in production at the Durgapur Alloy Steel Plant, expansion of Mysore Iron & Steel Works and a refractory plant as well as a seamless tube plant for Bhilai. In the private

sector IISCO is expanding its present one million tonne capacity to 1.3 million tonnes. It has also been decided to establish three new steel plants one each in Andhra Pradesh, Tamil Nadu and Mysore and work on all three plants is scheduled to begin during the Fourth Plan period.

Challenge of the Seventies

On the basis of the present plans and according to the NCAER estimates, the demand for steel is expected to rise to 14.1 million tonnes in terms of ingots by 1975 76 and to 20.5 million tonnes by 1980 81. The demand for arc welding electrodes bears a direct relation to the total production of steel and it is estimated that approximately 3.5 Kg of electrode filler wire are required on an average for every tonne of ingot steel used and on this basis the demand for electrodes should rise to nearly 50,000 tonnes by 1975 76 and over 70,000 tonnes by 1980/81 as against a production of about 25,000 tonnes in 1969.

There is no doubt, therefore, that the welding industry can look forward to a period of steady expansion. Moreover, since this expansion and development will not merely be in quantitative terms but in terms of new types of fabrication involving special steels, stainless steel and various other metals, it is clear that a great challenge faces the welding industry in the seventies.

There is little reason to doubt that the manufacturers of welding equipment and consumables in India are capable of meeting the challenge that faces them and also that the engineering industry is capable of carrying out the more sophisticated fabrication work which involves new techniques of welding and the use of new metals and special steels. The only disturbing factor in the situation is the political instability as a phenomenon which is affecting India as a whole with certain regions, the Eastern for example, much more acutely affected than others.

Affiliation to International Institute

At our past Annual General Meetings I have been reviewing developments in the field of welding technology abroad as well as in India and I propose to continue this practice again this year. Before I go on to do so, however, I would like to refer to one notable event that took place recently. At the 23rd Annual Assembly of International Institute of Welding held at Lausanne, Switzerland from 12th to 18th July 1970 The Indian Institute of Welding was elected a member of the International Institute. India thus becomes the third Asian country to be admitted to membership of this august body, the other two countries being Japan and the Peoples Republic of China. This is indeed a great achievement and a recognition by the world of the stature of your Institute and of the high standards achieved in welding technology in this country. A delegation of four members represented India at the Annual Assembly ; as President of your Institute I had the honour of leading the delegation, the other delegates being Mr R Ghosh, Mr P S Viswanath and Professor H Zuern. It gives me great pleasure to report that the Indian delegation participated actively in the proceedings of the Assembly ; of the 16 commissions which deal with the various aspects of welding technology, we were represented in as many as seven of them enabling a useful exchange of views on modern developments in various fields. Problems of research, the impact of new techniques of welding and related processes, fabrication methods, the increase of safety factors, lowering of costs, developing of standards in regard to welding products and processes, testing methods and health were among the many subjects discussed. India will be represented on the Governing Council of International Institute of Welding by Mr I T Mirchandani and myself.

Developments Abroad

In the international field there has been further consolidation supported by improvements and extensions of existing processes and techniques.

Friction welding, for example, which was confined hitherto to small sections has now been extended to larger diameters. Vertical and horizontal electroslag welding of ships' sides has been successfully carried out in Japan. Experiments of interest in the same country are the forming of complete drums for pressure vessels entirely by the deposition of metal by the electroslag process and considerable saving in fabrication cost along with other advantages is claimed for this process. Further experiments in this field to form the dished ends and tube headers for pressure vessels by electroslag welding are reported to be in progress.

Two other developments abroad to which I would like to refer are, firstly, the MIG welding of copper with copper wires having special deoxidents and with nitrogen gas shielding and, secondly, automatic arc air gouging employing fluxcored tubular wire. The brazing process, already very much an established success, is reported to have embarked on a vastly successful 'second childhood'—experiments on vacuum

brazing in USA reveal that by pressing under high vacuum, in an atmosphere free of oxidising gases, a superior product with greater strength, durability and uniformity may be obtained more economically than by brazing methods previously used. My "list" would not be complete without reference to the considerable extension of the fluxcored continuous electrodes with and without gas flux shielding which are becoming increasingly popular both for MIG and automatic arc welding in USA, UK, USSR and Japan and other industrially developed countries. It is also heartening to learn that the Laser cutting machine which was developed sometime ago has now come into commercial use.

In India

In India there have not really been any significant developments during the year. As a result of the greater tempo of activity in the engineering industry there has naturally been a fairly big spurt in the demand for and production of welding equipment and consumables. The demand for industrial gases for welding has also risen although the curve in this case is not so steep, indicating that the demand for gases is not as elastic as it is for welding equipment and consumables.

With the continuing increase in labour costs, labour saving devices are inevitably becoming more popular. A marked difference in the attitude of industry to iron powder electrodes is discernible as also towards the automatic and semi-automatic arc welding processes.

TIG equipment and submerged arc welding equipment are now being manufactured in India and MIG equipment is in the process of development and may shortly be available. An extension in the range of other equipment is also taking place.

In the sphere of welding education much greater interest is being shown than was the case earlier. A major development in this field is the decision of Indian Institute of Technology, Madras, to start a two year post-graduate course in metal fabriction with provision for specialisation in welding technology. Indian Institute of Technology, Bombay approached your Institute for assistance in preparing a refresher course for senior technologists as well as a course in welding technology for their teaching staff. These are indeed gratifying developments which can but be in the interest of the future of welding technology in the country and I sincerely hope that these initial steps will be followed by bigger and bolder strides in future.

Steel Prices

The price of steel is a matter of such vital concern to the engineering industry that my address would not be complete without reference to it. There has recently been a further increase in price by the Joint Plant Committee and this must inevitably have its repercussions on the engineering industry. It is no secret that steel is not available at the officially announced prices and many engineering concerns are obliged to pay a high premium on the officially declared rates.

Problem of Raw Materials

Last year I referred to the difficulties which were being experienced in the production of stainless steel electrodes for general consumers arising out of the restrictions on the import of stainless steel wires ; I also mentioned that in April 1969 the Government had agreed to issue import licences for stainless steel wires. For various reasons, however, the import of stainless steel wires did not materialise resulting in the ridiculous situation that stainless steel electrodes, which manufacturers in India are quite capable of producing, have had to be imported. It is indeed a strange economy of foreign exchange that on the one hand we save on the raw material and then on the other are compelled to spend much more on the finished product.

Standardisation

Standardisation is a problem in which The Indian Institute of Welding has always been interested and I referred to one aspect of this question in my last year's report—the aspect dealing with standardisation in international projects executed with foreign aid. This year it gives me pleasure to report that both members of the delegation to the 7th meeting of International Standards Organisation (ISO) Technical Committee, ISO/TC 44 (the Committee responsible for developing international standards for welding) held in France in July were members of The Indian Institute of Welding ; I think that this is something of which we should be proud. Indian Standards Institution (ISI) is, of course, a participating member.

Exports

I have already mentioned that the demand for Indian engineering goods abroad has been rising steadily. That the quality of our goods is being appreciated is borne out by the repeat orders that many of our manufacturers have been securing in the face of

severe competition on a global basis. In the case of wagons, for instance, India's position in the world market is now well established. Even though unfortunately the Russian order has not materialised, other countries are continuing to buy from India—Korea has recently placed a fresh order for 2,000 wagons and Yugoslavia has ordered 1,000 wagons to be followed, it is hoped, by a much larger one. The quality of the wagon is, in the final analysis, largely dependent on the quality of the welding that goes into it and the reputation that India has won for her wagons is a tribute to Indian craftsmen and to the quality of Indian welding products. Once the problem of the steel shortage is resolved, exports of engineering goods will undoubtedly improve and Indian welding will have a further opportunity of contributing its share in this effort.

Next Phase

The Indian Institute of Welding has not been in existence long. Today, however, at this Fourth Annual General Meeting, as we look back on our brief past, we can feel a legitimate sense of pride at the considerable progress that we have been able to make. The Institute now has members in every region of the country from the South to the North, from the East to the West. The initial phase of the Institute's development, however, may now be said to be over. The organisational ground work has been laid and I consider it is time that the Institute passes on to a new phase of activity—one in which it may function predominantly in the development of welding technology in the country, in the research work that needs to be undertaken, as a centre for dissemination of advanced technology and as a clearing house for information on developments in the field of welding between different parts of India on the one hand and between India and the rest of the world on the other. Our recent election as a member of International Institute of Welding emphasises more clearly the greater obligation that devolves on us to develop along these lines.

In the sphere of standardisation and technical education also we have an important role to play. We have made a beginning by encouraging the introduction of a post-graduate course specialising in welding technology but it now remains for us to see that others introduce courses at the graduate and post graduate level and that improved facilities are set up for training welding engineers, supervisors and craftsmen. The problem of national standardisation of welding products, techniques, safety, certification and testing of welding products and welders and allied matters is being tackled vigorously by ISI and I am pleased to say that The Indian Institute of Welding and its members participate actively in the various committees and sub-committees of ISI which formulate these Standards. In their implementation The Indian Institute of Welding has a big role to play ; indeed in this sphere the closest link has been maintained and must eontinue between ISI and the Institute both at the individual and the Institute level.

The main effort, however, that The Indian Institute of Welding has to make is to bridge the vast gulf that separates welding in India from welding in more industrially advanced countries. This gap is still wide and with the anticipated imminent spurt in industrial activity the Institute has, in my view, a special responsibility now and throughout the years ahead to make a real effort to narrow this gap progressively and relentlessly.