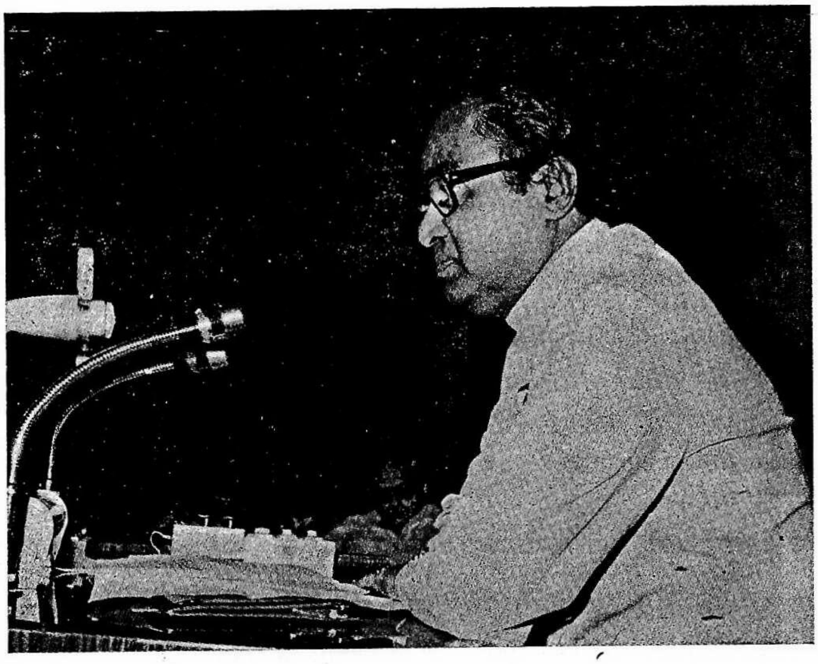
Inaugural Address



Shri N. K. P. SALVE

Hon'ble Minister for
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It gives me immense pleasure to be present here on this day to share with you some of my views regarding problems and prospects of Ferro-Alloy Industry.

Ferro-Alloy is defined as an alloy of iron that contains a sufficient amount of one or more chemical elements to be useful as an agent for introducing these elements into molten metal, usually steel. The iron and steel industry consumes perhaps 95% by weight of the ferro-alloys produced, however, other alloy systems, although relatively small in volume, represent substantial and growing markets with respect to value. The principal ferro-alloys are those of manganese and silicon. Manganese is used in the production of virtually all steels, primarily to neutralise the harmful effects of sulphur. Silicon is used primarily for deoxidation. Manganese and silicon also have important alloying effects. The uses of ferro-alloys are so numerous that it can be said that no steel can be made without the use of any one of the many ferro-alloys. The ferro-alloy industry forms the back-bone of crude steel, alloy, tool, special and stainless steel industries.

India's ferro-alloy industry is barely 25 years old. With considerable progress made with the development of the country's steel industry from the mid 1950's through the construction of the State owned steel works at Bhilai, Durgapur, Rourkela and later Bokaro and the expansion of TISCO in the private sector, the necessary impetus for the development of a modest ferro-alloy industry was provided.

As far as progress of ferro alloy industry is concerned, it is going ahead of the steel industry. Seven ferro-manganese plants were established during the second five year plan period, and later additional plants were set up for the production of other ferro-alloys like ferro-chrome, ferro-silicon etc.

The licenced capacity of ferro-manganese is 3.57 lakh tonnes, out of which a capacity of 2.93 lakh tonnes has been installed. In addition a few units have been registered for the production of ferro-managanese/silico-manganese under registration scheme. The production and export of ferro-manganese/silico-manganese during the last three years has been as follows :

(in '000 tonnes)

Year	Production	Export
1979-80	197.10	33.9
1980-81	180.8	Nil
1981-82	205.1	27.5

A large surplus is expected to be available throughout the Plan period (1980-85) and surplus production may continue to be exported. The estimated domestic demand for ferro-manganese/silico-manganese may be assumed as about 240,000 tonnes in 1984-85 In view of this no new capacity may be created for ferro manganese/silico-manganese.

As far as ferro-silicon is concerned, the licensed/installed capacity of ferro-silicon is 90,000 tonnes per annum. In addition a few units have been registered for production of ferro-silicon. The production and export of ferro-silicon during the last three years has been as follows :

(in '000 tonnes)

Year	Production	Export
1979-80	40.1	5.3
1980-81	52.6	Nil
1981-82	53.9	1.0

In this case also a large surplus in expected to be available through out the Plan period (1980-85) and hence no new capacity may be created except by diversification of the existing capacity to produce varieties which are being imported at pesent and which are likely to have recurring requirements.

The licensed capacity of ferro-chrome is 20,000 tonnes per annum. In addition, a capacity of 1.5 lakh tonnes has been licensed for charge chrome. The production and export of ferro-chrome/silico-chrome/chargechrome during the last three years has been as follows :

(in '000 tonnes)

Year	Production	Export
1979-80	20·6	6.8
1980-81	20.2	2.5
1981-82	34.3	8.2

The requirement of low carbon ferro-chrome, mainly for manufacturing stainless steel, is being met through import. The demand at present is established at 2,000 tonnes per annum. However, with the changes in the techniques for stainless steel-making this industry may increasingly use high carbon ferro-chrome/charge-chrome which is likely to be available in adequate quantity in the country. In view of the large surplus expected to be available through out the Plan period (1980-85), there is no scope for creating additional capacity in ferro-chrome/charge-chrome/silico-chrome.

A combined capacity of 2,600 tonnes of other ferro alloys has also been licensed in the organised sector. The small scale sector is reported to be having a sizeable capacity. The production during the last three years has been as follows :

Year	Production (tonnes)
1979-80	687.0
1980-81	654.0
1981-82 (April '81—January '82)	365.0

Adequate capacity to meet country's requirements exists; it is considered that no fresh capacity for other ferro alloys may be created. In case of ferro-nickel, however, creation of fresh capacity may be considered in view of the availability of indigenous raw-materials for its production.

Changes in technology in steel and iron production are gradually affecting the ratios of ferro-alloys consumption. The most important of these changes are as follows :

Continuous Casting

Bar, plate and some sheet products will be produced increasingly from silicon-deoxydised steel. Unit consumption of silicon will, therefore, increase.

Basic Oxygen Steel Making

Over all consumption of ferro-alloys per tonne of product will decline with tbe trend away from open hearth furnaces to basic oxygen furnaces. Recoveries of managanese are higher in basic oxygen furnaces since there is little time for slag reactions after cessation of the blowing cycle.

Electric Furnace Steel Making

Percentage of steel production by electric furnace methods is increasing rapidly, Since scrap is melted exclusively in an oxidising environment and the products are deoxydised steels, the trend is for higher unit consumption of both manganese and silicon. Similarly, the trend in foundry production is electric furnace melting, requiring more silicon and manganese per tonne of production.

The principal elements in the cost of ferro-alloys production include :

a) Delivery cost of the ore ;
b) Energy cost ;
c) Cost of reductant - coke or low ash coal ;
d) Cost of iron in the form of steel scrap ;
e) Labour.

Energy costs are a dominent factor in the cost of producing ferro-alloys in submerged-arc furnaces. Silicon alloys require the highest energy input, followed by chromium and manganese alloys. Both steel as well as ferro-alloy industry have been severely hit from time to time by power cuts.

Japan has pioneered the sintering of manganese and chromite ores and the use of a mixture of sinter and lump ore as the feed to the submerged arc furnace. Productivity has been increased substantially, and power consumption per tonne of product has been reduced : secondary benefits include more stable and uniform furnace operation with reduction in coke requirements. A Japanese ferro-chromium producer has adapted pelletising and pre reduction and feed pellets in a kiln prior to melting. The process utilises ore fines available at lower prices, coke and a binder, and there is substantial reduction of the iron oxide in the ore and some reduction of chromium. In the subsequent submerged-arc furnace operation, productivity is doubled and energy consumption is reduced about 50%. Such techniques may be adopted by Indian ferro-alloys manufacturers also in case it is found feasible in our conditions.

In view of the world wide general recession in iron and steel industry, the consumption of ferro-alloys has also gone down. This is true for India also. To compete in the inrernational market, the cost of production of Indian ferro-alloys has to match with the prevailing international prices, while ensuring the requisite quality standards. It is inevitable that as margins are narrowed and competition for declining markets increases, advantage is sought from technical improvements such as using double rotating split furnace body, the increased load and use of stronger electrodes and using effective energy recovery systems as part of a cost cutting approach. Plasma technology also offers an extra degree of freedom over the submerged-arc furnace process in that the feed rate of raw-materials and the power input can be directly controlled to maintain steady state conditions. The present world wide market situation for the requirements of ferro-alloys necessitates that all the ferrow-alloy manufacturers adopt the latest technology available to improve the productivity and reduce the cost of production without affecting the quality of finished product.

I hope that this will set the tone for the rest of the deliberations and some valuable and practical solutions could be comprehended by the end of this seminar for raising the quantum and standard of our ferro-alloys production and their subsequent optimal utilisation.