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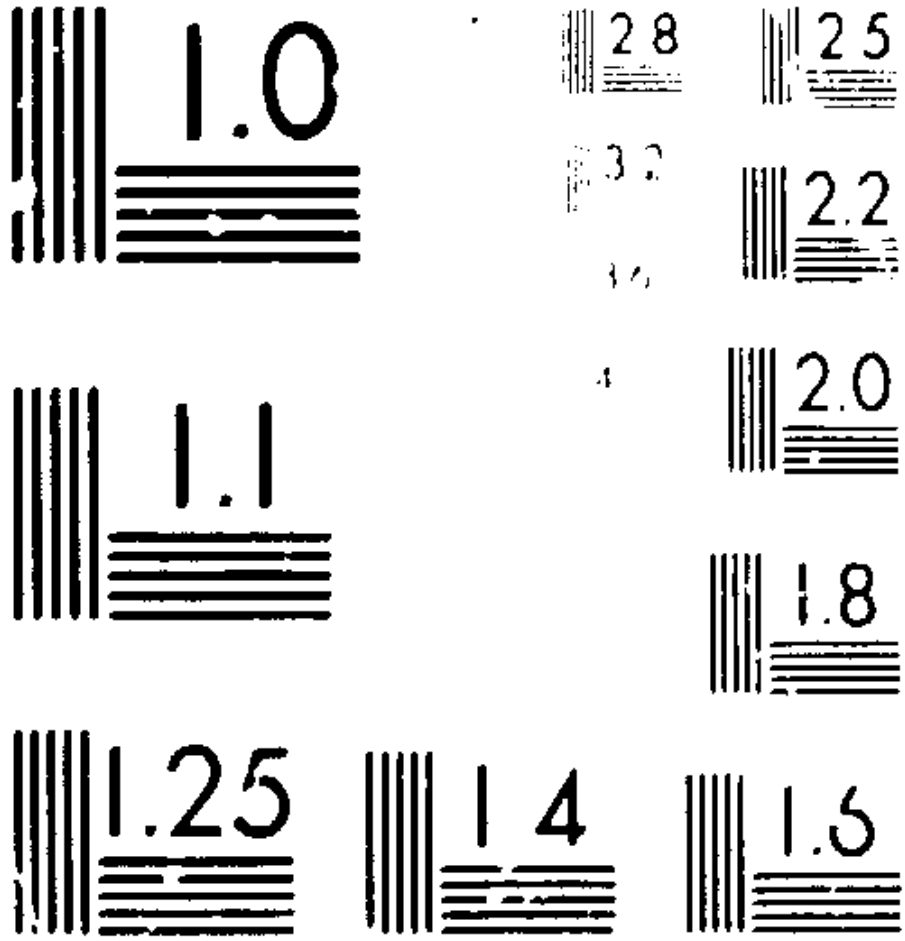
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EGYPTIAN IRON AND STEEL COMPANY AND ACTIVITIES FOR RESEARCH AND DEVELOPMENT OF THE PRODUCTION*

by

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Introduction.

Egyptian Iron & Steel Company (HADISOLB) is the first integrated steel plant, at Helwan, ARE, originally delivered by DEMAG the West German Firm.
The plant consists of two Blast Furnaces 1 & 2 each 570 m^3. B.F. 1 was commissioned in 1958 and B.F. 2 in 1960. 4 Thomas converters each 17 t, 2 electric furnaces each 12 t, a blooming mill, heavy section mill and a plate mill with an original raw steel capacity of 300, 000 t/year based on using low grade high phosphorus Aswan Iron ore.
In 1963, light section mill and a sintering plant No. (1) containing one sinter machine with 50 m^2 area, have been added. In 1974, another identical sinter machine has been erected in sinter plant (1). With a loan from USSR, an expansion of capacity 1.2 million ton raw steel per year had taken place, based on the use of low phosphorus Bahariya iron ore to reach a total design capacity of 1.5 million t/y. The full expansion, which has been commissioned in two stages the first in 1973 and the 2nd in 1979 contains the following main shops.

a) Sintering shop contains 4 sintering machines, each has 75 m^2 area.
b) Blast furnace shop consists of 2 B.F. Nos. 3 & 4 each 1033 m^3 volume.
c) L.D. shop consists of 3 converters each 80 t/heat.
d) Continuous Casting Shop consists of 3 two-Strand slabing machines and 3 six-strand billeting machines with design capacity of 1.2 million tons/year.
e) A continuous hot rolling strip mill, consists of one roughing stand and 6 continuous stands (put into operation in 1966.).
f) A cold rolling mill, consists of two reversible mills, a pickling line, annealing furnaces and temper mill.

The basic problem is that all shops are producing below the designed capacity, due to the following main problems.

1. The ore being delivered is varying from the previously defined basis for the expansion, being higher in silica and alkalies and lower in iron.
2. Adverse effect of Nacl in the ore on the sintering process and equipment.
3. Effect of alkalis in the sinter on the blast furnace operation.
4. problems facing the continuous casting of billets.
5. The deterioration of the old rolling mills of the original plant delivered by DEMAG after 20 years of continuous production.

Aiming to solve these problems facing the Company, so as to reach the designed capacity of 1.5 million ton raw steel/y, three feasibility studies have been recently accomplished. The first concerning establishing a suitable washing and concentration plant for Behariya iron ore, the second for revamping and rehabilitation of the original plant, and the third is a diagnostic study to identify and define the current problems being faced by HADISOLB and make appropriate recommendations and establish priorities for their solution. The Company has formulated a rehabilitation program for its facilities to be implemented on two stages financing by the World Bank and others.

Stage I program aims at increasing production to about 1.2 million tpy of liquid steel by early 1985 and improving process controls and operative methods to decrease production cost as well as increase productivity and quality.

Stage II program aims at increasing production from 1.2 to about 1.6 million tpy of liquid steel by early 1988.

Research and Development Activities

Now the management of the company keen to give the universities, scientific institutions and research centres inside and outside A.R.E the opportunity to sharethe General Directory of Research and Development in the company in solving the technical problems, developing the production, utilization of the waste materials and conservation of the energy consumption through the various stages in the production processes. This is achieved either as common researches or as scientific contracts.

Through these forms of scientific cooperation many technical problems are investigated and the results are issued in the form of definite solutions and/or recommendations.
Examples for these technical problems are as follows:

Exploration of new iron ore regions - evalution of the iron ore in Bahariya Oasis - removal of the high content of alkali chlorides in the Bahariya iron ore - concentration of the Bahariya iron ore - improving the productivity and quality of sinter - improving the operational conditions of the Blast furnaces - investigation of accumulations of alkali inside the blast furnaces- improving the operational conditions of the oxygen steel converters (BOF) - improving the productivity of the lime shaft kilns, and the quality of the produced lime - improving the quality of the refractory materials in the lining of the oxygen steel converters to prolong their service lives - temperature control of the molten steel for continuous casting - use of hot tops for the casting of steel ingots - production of Al-killed steel and stainless steel grades - improving the productivity and quality of galvanised steel sheets - utilization of the crystalline ferrous sulphate resulting from the pickle line - conservation of fuel consumption in the different processes - use of natural gas in operation of the furnaces - application of the oxygen blowing in the steel electric arc furnaces.

Examples of the scientific institutions in ARE are as follows:

Faculty of science, Cairo University - Faculty of Engineering, Cairo University - Academy of Scientific Research and Technology - Remote Sensing center-National Research Centre - Central

Metallurgical Research and Development Institute - El-Tabbin Institute for Metallurgical Studies.

Examples of the foreign scientific institutions are as follows:

- U.S. Steel Engineers and Consultants Corporation (UEC), U.S.A.
- Hasan Brkic Institute, Zenica, Yugoslavia.
- Katholieke Universities, Belgium.
- International Metals S.A., Luxembourg.
- Institute De Recherches De La Siderurgie Francaise, France.

The scientific cooperation with these local and foreign institutions is continues in improving the productivity and quality of the products, reduction of the operation costs, utilization of the waste materials and conservation of fuel consumption.

This scientific cooperation make significant contribution for the application of the modern trends in the technology of the iron and steel industry in the different stages of production in the company factories.