CHAPTER -2

TUNGABHADRA STEEL PRODUCTS LIMITED
- A PROFILE
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Purpose and Overview :

This chapter, being a background chapter, aims at providing a brief account of origin and growth of steel industry in India, besides giving a profile of the study unit i.e. TSP Limited.

Introduction :

The process of making iron and steel has been in practice in India for the last several thousands of years..... Egyptians were familiar with Indian iron and steel and they either imported the material or obtained the services of Indian workers in metals to produce the necessary materials for the tools employed on the great stone monuments. The Hindus have been familiar with the manufacture of steel from times immemorial. The tradition of iron production in India is rooted in the labyrinth of hoary antiquity. The metal is referred vedic literature as "Ayas". The antiquity of the Indian process is no less astonishing than its ingenuity.  

There is no evidence to show that, any of the nations of antiquity besides the Hindus (Indians) were acquainted with the art of steel making. 

The references which occur in Greek and Latin writings on this subject served only to reveal their ignorance of it, they were familiar with the use of steel, but they appeared to have been altogether ignorant of the mode by which it was prepared. Hence, the early days of the iron and steel industry provides

an interesting study. An idea of the early development of the iron and steel industry is a prerequisite to understand the present trends of development in India.

**Iron and Steel Industry in Primitive India:**

The art of smelting iron was known in India in ancient times. References to iron has been made in the Rig Veda (2000 BC) and it is said that, India is the first producer of carbon steel (Wootz). The famous iron pillar of historic antiquity were built in India. India is considered to be the centre of origin of the iron and steel industry in the world. The iron age in India was started about 3000 years ago. In those days, Hyderabad and Madras in South India were the centres of production of wootz, the ancient steel was highly priced in world market.

The primitive art of iron making consisted of heating a mixture of iron ore and charcoal in very small furnaces with the help of air blast, supplied by goat skins. This simple method of manufacture was in vague in many parts of the world. In fact, there are even now a few such furnaces functioning occasionally in very out-of-the-way places in India. The most celebrated mass of ancient Indian iron is the iron pillar standing near the Kutub Minar, though it was old, it has not shown any tendency to rust. There are several inscriptions, the most one being in the gupta script probably of third or fourth century A.D.

The process of producing steel from the ore was described in 'Ain-I-Akbari', a chronicle of the life events and history of the great mughal. It

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reveals that, artisans at Nirmal (presently a small town in Telangana area of Andhra Pradesh) reduced powdered magnetite and haematite in small, but flattish, slightly convex, crucibles, using wood or green leaves as reducing and carburising agents. The product obtained was a small cake of steel, few inches in diameters, evidencing at the top verified slag, unmelted iron and dense steel at the bottom. This steel was widely sought in Persia and Central Asia for making the so called Damascus blades.

Iron Making Industry During 19th Century in India:

The first smelter for iron ore in India was started by J.M. Heath, who was a civil servant of East India Company, at Porto Novo, Tamilnadu in 1830. A company called the Indian Iron Steel and Chrome Company was formed. In 1833, furnaces and rolling mills were also formed at Boypur and Malabor. The Boypur works obtained ore from the laterite near Calicat and Feroke. Another new company called, East India Iron Company was formed in London in 1853. This company erected smelters and works at Tiruvannamalai in North Arcot and at Pulampatti on the Kaveri between Bhavani and the present Mettur dam. The Pulampatti works obtained iron ore from Kanjamalai in Salem. Indian iron was found to be superior to any English iron for making files and superior to most of the ordinary marks of Swedish iron for making steel. In 1875, the Napeir Foundry Company (Tamilnadu) was established for the manufacturing of iron, this concern was granted an area of 42 sq. miles of forests in North Arcot for making charcoal. However, this agreement was terminated in 1877.

The Bengal Iron Works, which came into existence in 1874 and started to blast furnaces at Kutti which lies between Sitarampura and Barakara,

145 miles west of Calcutta. The Bengal Iron Works Company had to acquire collieries for the steady supply of fuel at reasonable prices. The works were completed by 1877. The coal supply was obtained from Sanctoria, Pura and Belsui in the Raniganj field. This works were acquired by the Govt. in April, 1882 and then they were known as the Barakara Iron Works. Ore blast furnace was started on 1 January, 1884 and second blast was erected in 1889. In 1889, the Govt. transferred the undertaking to a private firm called M/s Martin and Company. 

The development of the iron and steel industry in different parts of India was inspired by the availability of iron ore and charcoal. During the 19th century, the industry declined rapidly because of two reasons: The disappearance of the forest and the availability of mass produced iron from Europe at cheaper rates. It may be mentioned that, even at the beginning of the 20th century, there were several hundreds of furnaces, scattered over the country.

**Development of Steel Industry During Five Year Plans:**

**First Five Year Plan (1951-1956):** The iron and steel industry received remarkable impetus by the plans and hence it took rapid strides. Since the first plan was preoccupied with agriculture industry in general, so iron and steel industry did not receive any patronage, hence it had a sluggish growth. However, provision was made for the development of the iron and steel industry and for raising the existing plants to full capacity. In 1953, the Steel Corporation of Bangal was amalgamated with the Indian Iron and Steel
Company. Hence, the Indian Iron and Steel Company became an integrated iron and steel producing unit.

**Second Five Year Plan (1956-1961):** During the second five year plan, the iron and steel industry had the most spectacular and evenful growth. Highest priority was given to the development of the iron and steel industry and provision was made to revise the capacity from 1.5 million ingot tonnes to 6 million ingot tonnes. During this plan, Mysore Iron and Steel Industry received a big boost from the Central Government. Three steel plants were set-up: one at Rourkela in Orissa (with Russian assistance) and another at Bhilai in Madhya Pradesh (with Russian assistance) and the third one at Bengal (with British assistance), each with initial capacity of one million tonnes. The steel plants were inaugurated with a big fanfare, at the beginning of the second plan. The first two plants, started production at the end of the plan period, whereas the third one was completed in 1963.

**Third Five Year Plan (1961-1966):** Under the third five year plan, three public sector mills were expanded and fourth mill was to be established at Bokaro in Bihar state, but the construction of the Bokaro mill was delayed. The Govt. refused to allow further growth of the private sector plants during this plan. The expansion of existing public sector mills, was delayed for three years and they were completed only during the first year of the fourth five year plan period.

During mid sixties, the Indian economy was planned by a series of unfavourable events; the war with China and Pakistan, stagnation of agriculture, inflation and severe food shortage. These events did not allow the normal planning process to continue. Instead of continuing with the mid-term
plans, there were four annual plans for four years in succession, as the company had to spend a large amount of its financial and physical resources for dealing with multidimensional crisis during this period. As a result, investment in all along gestation projects had to be postponed. The planned development of the iron and steel industry was affected because of the delay in plan implementation.

**Fourth Five Year Plan (1969-1974):** During this plan period, the installed capacity of the main plants was expected to go up to 12 million tonnes of ingots. This was to come through the expansion of capacity of the Bhilai plant and IISCO and the completion of the second phase of Bokaro plant (2.5 million tonnes). However, these expectations did not materialise during the fourth five year plan because of a number of problems, which were partly economic and partly political. All of a sudden, the Government announced the setting up of three new plants at Salem, Vishakapatnam and Vijayanagar (Bellary District). But the erection of these plants has been postponed for years together.

**Fifth Five Year Plan (1974-1979):** According to the draft of 5th plan report, 71 lakh tonnes of steel ingots and 54 lakh tonnes of finished steel were produced during 1973-74 and during 1974-75, the production of finished steel rose to 64 lakh tonnes and during 1976-77 the highest production of 78 lakh tonnes of steel was achieved.

The expansion programme of Bhilai (from 2.5 million tonnes to 4 million tonnes) and Bokaro (2.5 million tonnes to 4 million tonnes) were also to be taken up during the fifth plan period. However, the programme for new and additional capacity creation did not get materialised. The scope for the
proposed plants at Vishakapattnam and Salem had to be dropped. As a result, there was only a marginal addition to the steel making capacity till the end of the sixth plan (1980-85).

**Sixth Five Year Plan (1980-1985):** The sixth plan targets for production of transport equipements, electrical equipements, industrial machinery and metal products together with projected requirements of steel as construction input, this indicates that, the demand for finished steel would rise from 8 MTs to 12.9 MTs in 1984-85. The outlook for 1980-81 is not better than the previous year. Already being a net exporter of steel during 1976-77 and 1977-78, India has become a net importer of steel despite the slow growth in output.

**Seventh Five Year Plan (1985-1990):** The Bokaro and Bhilai expansion programme was expected to be completed during this plan. Hence, the projected increases in the capacity utilisation of the existing public sector plants were also not materialised. Therefore, there was a considerable shortfall in production. The actual production was only 8.80 MTs as against the target of 11.50 MTs during sixth plan.

**Eighth Five Year Plan (1992-1997):** The programme of development of steel industry in the eighth plan was aimed at improving the technological health of the existing integrated steel plants and modernisation and upgradation of technology in order to achieve international competitiveness in respect of both cost and equality. Modernisation of Durgapur and Rourkela plant in public sector and Tata Iron and Steel Company in the private sector was completed during the eighth plan.
Ninth Five Year Plan (1997-2002): The ninth plan aimed at producing a steel not only for domestic market but also for export on the basis of the inherent strength of the Indian steel industry.

At present, there are six integrated steel plants in the country. Five in the public sector and one in the private sector. The five steel plants in the public sector are Bhilai, Rourkela, Durgapur and Bokaro and the Indian Iron and Steel Company (IISCO) at Bumpur. The private sector steel plant is the Tata Iron and Steel Company (TISCO) at Jamshedpur. The establishment of Steel Authority of India (SAIL) in 1973 is a landmark in the history of Iron and Steel Industry in India. The SAIL, now, is the main integrated steel company with five public sector steel plants. In the year 1992, India occupied 10th place in the largest producers of steel in the world.

Table 2.1 indicates the trends in production and sale of steel in India.

Table 2.1: Trends in Production and Sale of Steel in India

(Rs. in crores)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Units</td>
<td>Annual</td>
</tr>
<tr>
<td></td>
<td>Tonnes</td>
<td>Growth (%)</td>
</tr>
<tr>
<td>1992-93</td>
<td>15200</td>
<td>NIL</td>
</tr>
<tr>
<td>1993-94</td>
<td>15200</td>
<td>NIL</td>
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<td>1994-95</td>
<td>17820</td>
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<td>1995-96</td>
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<tr>
<td>1996-97</td>
<td>22720</td>
<td>6.17</td>
</tr>
<tr>
<td>1997-98</td>
<td>23370</td>
<td>2.86</td>
</tr>
</tbody>
</table>


Table 2.1 depicts the trends in production and sale of steel in India from the year 1992-93 to 1997-98. The annual growth of steel production raised...
upto 17.23 per cent in the year 1994-95, at the same time sales also increased to 21.83 per cent. In the year 1995-96 the production increased to 20.09 per cent; whereas the sales decreased to 14.64 per cent. Thereafter, there was a declining trend in production and in sales.

Historical Background of Tungabhadra Steel Products Limited:

Water is the basic need for the food production and rapid industrialisation. Development of irrigation and hydraulic power has assumed vital importance in the nation's growth. Therefore, design, manufacture and installation of hydraulic structures have assumed an added significance. It is against this background the TSPL has been established on 18th April, 1960 as a public enterprise.

Tungabhadra Steel Products Ltd. (TSPL) is a successor to work shop and machinery division of Tungabhadra Project and then division was started in the year 1948 for maintenance of project machinery, in the year 1952 the division was converted into a shutter manufacturing unit for manufacture of gates and allied equipments required for the Tungabhadra Project. The shutter manufacturing factory was inaugurated by the late Pandit Jawaharlal Nehru, the then prime minister on 27th Feb. 1952. Therefore, to expand the activities of workshop, Tungabhadra Steel Products Ltd. was formed in 1960 as a public sector undertaking and registered under the Companies Act 1956 with equal equity participation by the Governments of Mysore and Andhra Pradesh. In the year 1967, the Government of India invested 51% of its share capital and became the major share holder. TSPL now has become a subsidiary (company) of M/s Bharat Yantra Nigam Limited (BYNL), under the administrative control of the Ministry of Heavy Industry, Government of India.
MAP SHOWING LOCATION OF KARNATAKA STATE.
LOCATION: Tungabhadra Steel Product Ltd. is situated at Tungabhadra Dam locality, a potential place which is 5 Kms west to Hospet, a mineral town of Karnataka. The originally located workshop of the company was shifted under an expansion scheme to a new location with an improved layout and facilities. It has branch offices at Bangalore and Hyderabad.

Objectives of the TSPL:

TSPL has been started as a workshop and machinery division for maintenance of machinery of Tungabhadra Project. Hence, the primary objective of the TSPL was to facilitate the Tungabhadra Project. In the year 1952, the division was converted into a shutter manufacturing unit for manufacture of gates and allied equipments required for the project. Thereafter, the activities of workshop were expanded and TSPL has been formed as a public sector undertaking and registered as a company in the year 1967. After having the status of public sector undertaking, the company has versatile objectives in its manufacturing line. Therefore, the main objectives of the TSPL are designing, manufacturing and installation of hydraulic structures, cranes, pen stock pipes, rubber seals, etc., to develop the irrigation and hydro-electric power generation.

Growth and Collaboration of the TSPL:

TSPL has registered a remarkable growth in its operation for the last 35 years of its service to the nation. From a production value of Rs.38 lakhs with employees strength of 450, the company has grown up to achieve a production value of Rs.3090 lakhs with employees strength of 959, with a turnover of Rs.29.62 crores in 1996-97. TSPL executed prestigious orders of Uganda, Koyna, Amarja, etc.
MAP SHOWING LOCATION OF BALLARY DISTRICT.
**Collaboration:** TSPL had a technical collaboration with M/s Neyrpic, France who are reputed in the field of hydro-mechanical equipments required for operation of gates. This collaboration has lasted for a period of seven years in the first instance from 1962 to 1969 and was further extended for a period of five years i.e., upto 1974. The company has finalised working arrangements with M/s ACES, Belgium for the manufacture, supply and installation of mini and micro Hydro Turbine in the country. At present, TSPL has contacted Noell of Germany and Mitsubishi of Japan to have a joint venture for design, manufacture and installation of gates and also upgradation of the existing technology.

**Ownership and Organisation of TSPL:**

The ownership of TSPL is in the hands of Government of India (51%), the Government of Andhra Pradesh (24.5%) and the Government of Karnataka (24.5%). It is organised as a joint stock company under the Companies Act 1956. The day to day management is vested in the Board of Directors, which consists of a Chairman, Managing Director and five other Directors. The organisational structure of TSPL is shown in chart 2.1

**Organisational Structure of TSPL:**

TSPL is enjoying the privilege of ISO 9001 since 1994, its organisational structure is as follows:

**Managing Director (MD):** Managing Director is the key person and the Head of the Administration of the TSPL. All personnel, right from General Manager to floor men are working under him. Managing Director is appointed by the President of India.
CHART 2.1 : ORGANISATIONAL STRUCTURE OF TSPL

MANAGING DIRECTOR

DGM Bus. Div.
- Marketing / Sales
- Regional Offices

DGM Technical
- Design
- Product Development
- Inspection / Quality Control

Senior Manager Systems
- Production Planning
- Material Planning
- Sub-contract
- EDP
- Industrial Engineering
- Systems
- Transportation

GM
- Production
- Maintenance
- Material Management

DGM Services
- Erection / Commissioning

DGM Finance
- Accounting
- Treasury
- Costing
- Payroll
- Budgeting
- Pre Audit
- Billing
- Funds & Taxation

- Secretarial
- System Audit
- Administration
- Personnel
MAP SHOWING LOCATION OF HOSPET TALUK.
**General Manager (GM):** General Manager is in charge of administration and he will be the chief vigilance officer of the company. He is the employer of the company under Companies Act. Though he works under MD, his powers are supreme as he is the master of the unit and all works in the plant take place according to his directions. General Manager is appointed by Board of directors of Bharat Yantra Nigam Limited (BYNL). The branches viz, iron and steel installation and services, personnel (civil and welfare), research and development work under his close supervision. All these departments should get financial approval for their purchases.

**Deputy General Manager (DGM):** Deputy General Manager functions under General Manager. Each department in the TSPL has Deputy General Manager as its head. He will be the in-charge for all the sections coming under his jurisdiction.

**Organizational Divisions of TSPL:**

The organisational divisions of the TSPL are as under:

**Business Development:** This department is headed by Deputy General Manager. This department will quote for the works as per tender notification in consultation with technical division so that the technical division will help them in arriving preliminary design, quantities, etc. Then, the finance department provides basic rates for the raw materials, bought-out items, fabrication cost of the product, etc. Once the tender is finalised, the department issues work order to the production department as per the agreement with the customer. This department is further divided into three sub-sections viz, marketing, sales, regional offices.
**Technical Division (Designs):** Deputy General Manager (Technical) will be the in-charge of this section. After receiving work orders from business development department, he will prepare designs and drawings as per the agreement conditions or relevant Indian standard codes, such designs and drawings should be finally approved by the customers.

**Inspection and Quality Assurance (I & Q A):** Inspection and quality assurance department works under the headship of senior manager; who inspects the product stage by stage in order to ensure the standard predetermined as per the designs and drawings, then the product will go out of the factory only after the thorough inspection.

**Systems Division:** Deputy General Manager is the in-charge of this section. Once the fabrication drawings are received from technical division, based upon agreement condition and load on shop floor, they plan for the work to be completed as per customer requirements.

**Planning Department:** Planning department is headed by Manager. After receiving the approved drawings from technical division, this department issues purchase requisitions to material management. Once the materials are received, it will co-ordinate with production people and the other departments for timely completion of the work.

**Material Management:** This section is headed by Manager. After receiving the purchase requisitions from planning department, it starts with process for procurement of materials. To procure materials, it sends tender enquires to
MAP SHOWING TSP'S CONTRIBUTION TO THE NATION.
short list suppliers. Once the tenders are received, it will evaluate by designs and technical parameters and by accounts and cost aspects. After finalising the tenders by competent authorities, it places an order for procurement of materials, such materials are then inspected by I & Q A department.

**Industrial Engineering Department**: This department is headed by Senior Engineer. It will support planning department and sub-contracts departments regarding time studies, machine hours, labour hours required for completion of the work.

**Methods Department**: This section is headed by Manager. The personnel of this section will formulate the procedure and methods to be adopted in the shop floor for fabrication of the given work and they guide the shop floor people to carry out the work according to the prescribed schedule.

**Production Department**: This department is headed by General Manager Production and executes production as per the approved drawings and designs.

**Transport and Sub-Contract**: This is headed by Deputy manager. This department arranges for the transportation of the products to the customer site. Sometimes, it also obtains the same services from outside transport agencies. This department also looks after the sub-contract of fabrication works.

**Electronic Data Processing (EDP)**: This department is headed by Deputy Manager. It is a supporting department to all the sections like, materials,
designs, planning, accounts etc. in connection with storing of data, preparation of schedules, wage bills, salary, etc.

**Installation and Servicing**: This department is headed by Senior Manager. Once the materials are received at site, they are properly stored and they undertake the installation of equipment in co-ordinations with the civil works department. After performing the installation, testing, commissioning of the equipment, they also ensure the service. Usually this work will be entrusted to sub contractors.

**Operations Department**: This is headed by Deputy Manager Operation, who looks after overall working of erection at site for completing the work as per customer requirement.

**Civil and Welfare**: This department is headed by Manager; who looks after proper upkeep and maintenance of factory premises and employees residential quarters.