ADMINISTRATION MANAGEMENT & DEVELOPMENT OF SAIL-A STUDY

NATIONAL STEEL POLICY 2005 : OBJECTIVE, RESEARCH DESIGN :

Objectives, Hypothesis & Research Design.
New Initiative-Challenges & Opportunities
National Steel Policy 2005

Objective

Strategic Goal: The long-term goal of the national Steel Policy is that India should have a modern and efficient Steel Industry of world standards, catering to diversified steel demand. The focus of the policy would therefore be to achieve global competitiveness not only in terms of cost, quality and product-mix but also in terms of global benchmarks of efficiency and productivity. This will require indigenous production of over 100 million tonnes (MT) per annum by 2019-20 from the 2004-05 level of 38 MT. This implies a compounded annual growth of 7.3 percent per annum.

The above strategic goal is justified on the ground that steel consumption in the world, around 1,000 MT in 2004, is expected to grow at 3.0 percent per annum to reach, 1,395 MT in 2015, compared to 2 percent per annum in the past fifteen years. China will continue to have a dominant share of the world steel demand. At home the Indian growth rate of steel production over the past fifteen years was 7.0 percent per annum. The projected growth rate of 7.3 percent per annum in India compares well with the projected national income growth rate of 7-8 percent per annum, given an income elasticity of steel consumption of around.

In terms of consumption of steel, defined as production plus imports minus exports, the present equation is 38 + 2-4 = 36 MT in 2004-05. Table 1 gives the equation for 2019-20 and the projected compound annual growth rates for production, imports, exports and consumption.

Industry Structure

The iron and steel industry in India is organised in three categories viz. main producers, other major producers and the secondary producers. The main producers and other major producers have integrated steel making facility with plant capacities over 0.5MT and utilise iron ore and coal/gas for production of steel. In 2004-05, the main producers i.e. SAIL, TISCO and RINL had a combined capacity of around 19.3 MT and capacity utilisation was 104 percent. The other major producers comprising ESSAR, ISPAT and JVSL had a capacity of 6.4 MT with capacity utilization of 97 percent. The secondary sector is dispersed and consists of:
Table 1: Production, Imports, Exports and Consumption of Steel

<table>
<thead>
<tr>
<th></th>
<th>Production</th>
<th>Imports</th>
<th>Exports</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019 - 20</td>
<td>110</td>
<td>6</td>
<td>26</td>
<td>90</td>
</tr>
<tr>
<td>2004 - 05</td>
<td>38</td>
<td>2</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>CAGR*</td>
<td>7.3%</td>
<td>7.1%</td>
<td>13.3%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Note: * Compounded Annual Growth Rate

World steel Dynamics, Steel Success Strategies, 25th June 2005

(a) Backward linkage from about 120 sponge iron producers that use iron ore and non-coking coal, with a capacity of around 13 MT, providing feedstock for steel producers. The capacity utilisation in 2004-05 was 75 per cent.

(b) About 650 mini blast furnaces, electric arc furnaces, induction furnaces and energy optimising furnaces that use iron ore, sponge iron and melting scrap to produce steel. Their capacity is around 14.7 MT, and capacity utilisation in 2004-05 was 58 per cent.

(c) Forward linkage with about 1,200 re-rollers that roll out semis into finished steel products for consumer use. These are small and medium enterprises, whose reported capacity is around 15 -MT, and capacity utilisation in 2004-05 was 55 per cent.

3. SWOT ANALYSIS OF THE INDUSTRY

3.1 The strengths, weaknesses, opportunities and threats for the Indian steel industry have been tabulated below. The national steel policy lays down the broad roadmap to deal with all of them.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Availability of iron ore and coal</td>
<td>1. Unscientific mining</td>
</tr>
<tr>
<td>2. Low labour wages rates</td>
<td>2. Low productivity</td>
</tr>
<tr>
<td>3. Abundance of quality manpower</td>
<td>3. Coking coal import dependence</td>
</tr>
<tr>
<td></td>
<td>5. High cost of debt</td>
</tr>
<tr>
<td></td>
<td>6. Inadequate infrastructure</td>
</tr>
</tbody>
</table>
Opportunities | Threats
---|---
1. Unexplored rural market | 1. China becoming net exporter
2. Growing domestic demand | 2. Protectionism in the West
3. Exports | 3. Dumping by competitors
4. Consolidation | |

4. STRATEGY

4.1 A multi-pronged strategy would be adopted to move towards the long-term policy goal. On the demand side, the strategy would be to create incremental demand through promotional efforts, creation of awareness and strengthening the delivery chain, particularly in rural areas. On the supply side, the strategy would be to facilitate creation of additional capacity, remove procedural and policy bottlenecks in the availability of inputs such as iron ore and coal, make higher investments in R&D and HRD and encourage the creation of infrastructure such as roads, railways, and ports.

5. STEEL DEMAND

5.1 Urban Areas: The present steel consumption per capita per annum is about 30 kg in India, compared to 150 kg in the world, and 350 kg in the developed world. The estimated urban consumption per capita per annum is around 77 kg in the country, expected to reach approximately 165 kg in 2019-20, implying a CAGR of 5 per cent. Apart from the anticipated growth in the construction, automobile, oil and gas transportation, and infrastructure sectors of the economy, conscious promotion of steel usage among architects, engineers and students by the Institute of Steel Development and Growth (INSDAG) and the large producers will drive this additional consumption. Steps would be taken to encourage usage of steel in bridges, crash barriers, flyovers and building construction. Benefits of steel usage would be added to the technical education curricula in the country.

5.2 Rural Areas: The rural consumption of steel in India remains at around 2 kg per capita per annum, primarily because steel is perceived to be expensive among the village folks. Based on the promotional efforts mentioned above, and an active focus on opening new block level rural stock points, a target is set for raising the per capita rural consumption of steel to 4 kg per annum by 2019-20, implying a CAGR of 4.4 per cent.

5.3 Exports: Although the focus of Indian steel industry is on the domestic market, export will be another window on the demand side. The growth of exports of steel from India has been around 10 per cent per annum over the past decade. That speaks
for the international cost competitiveness of the steel sector. It takes assiduous effort to create, and hold on to export markets. While the business decision to export will depend on the prevailing relative prices, the Government would encourage strategic alliances with buyback arrangements and dedicated export production through 100% export-oriented units. A growth rate of around 13 percent per annum is envisaged up to 2019-20. The issues related to exports have been discussed in section 13 on Trade Policy.

6. STEEL SUPPLY

6.1 While the country has rich endowments of iron ore and non-coking coal, and has cheap labour, this advantage is neutralised considerably by low material and energy efficiency, poor quality, poor productivity, and high cost of coking coal, power, freight and finance. The policy for making the critical inputs available to the industry is outlined in the following paragraphs.

6.2 Critical Inputs: In order to support steel production of 110 MT by 2019-20, at 100 per cent capacity utilisation, the required quantities of critical inputs such as iron ore, coking and non-coking coal can be seen in Table 2 below. The projected requirements are based on the assumption that new capacities will be 60 percent through the Blast Furnace (BF) route, 33 percent through the Sponge Iron - Electric Arc Furnace (EAF) route and 7 per cent through other routes.

Table 2: Critical Inputs for Steel Production

<table>
<thead>
<tr>
<th></th>
<th>Iron Ore</th>
<th>Coking Coal</th>
<th>Non-Coking Coal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019-20</td>
<td>190</td>
<td>70</td>
<td>26</td>
</tr>
<tr>
<td>2004-05</td>
<td>54</td>
<td>27</td>
<td>13</td>
</tr>
</tbody>
</table>

6.2.1.1 Iron ore: At present, the in-situ reserves of relatively rich iron ore in India are 11.43 billion tonnes of haematite and 10.68 billion tonnes of magnetite ores. Though the reserves of haematite ore appear to be large, high-grade lumpy reserves constitute only 8.7 per cent of the total. Further, the present commercial mining capacity for iron ore is only 175 MT. Production of iron ore in 2004-05 was 145 MT, of which 54 MT was domestically consumed and 78 MT was exported. Of the 600 mining leases, only 246 were operated in 2003-04.
6.2.1.2 In order to ensure availability of 190 MT of iron ore for domestic production of steel by 2019-20, Government would encourage investments in creation of an additional modern mining and beneficiation capacity of 200 MT. The size of these investments will be around Rs. 20,000 crore. The current policy of captive mining leases for the private sector would continue, but it is necessary that investment plans be put in place for idle mining leases. State governments would recommend renewal of existing leases only against credible mining investment plans in a specified period. The Government would lay down priorities and guidelines for the State governments to recommend fresh mining leases, having regard to the entrepreneur's mining investment plans, and technical and financial capabilities. Environmental and forest clearances would be granted within a pre-specified time-frame. Though local value addition would be given priority, the Government would encourage iron ore trading in order to make this essential raw material available to the iron and steel industry throughout the country. The Government would encourage investments in adding value to iron ore fines. Scientific mining and economies of scale would also be encouraged through consortia of small users and by prescribing a minimum economic size for mines.

6.2.2 Exports of iron ore: After remaining stagnant at around 35 MT for about a decade (between 1991-92 to 1999-2000), exports of iron ore from India have grown in the last 4 years to 78 MT in 2004-05 on the back of large exports of iron ore fines to China. Fines and concentrates, which have little use in India except as a negative environmental externality, make up about 90 per cent of Indian iron ore exports currently. As investments are made into beneficiation, sintering and pelletisation in the country, which will use these fines, the growth in exports of iron ore is likely to decline. Exports have thus been estimated to be around 100 MT by 2019-20. In terms of future policy, exports of iron ore, especially high-grade lumps, would be leveraged for imports of coking coal or for investment in India. Long-term export supply of iron ore would be confined to a maximum of five-year contracts. This duration would be reviewed from time to time. A judicious balance would continue to be maintained between exports and domestic supply of iron ore.

6.2.3.1 Coking Coal: The proven reserves of prime coking coal are only 4.6 billion tonnes. The quality of Indian coking coal is also not suitable for steel. The production of coal during 2001-02 was 328 MT, out of which coking coal amounted to only 29 MT. The low ash coking coals required by steel makers was around 10 mT in 2001-02. Coking coal production has declined at an annual rate of 4.7 per cent during the decade ending 2001-024, 6.2.3.2 Poor quality domestic prime coking coal has to be blended with imported coal. Currently the steel industry imports around 19
MT of coking coal annually, and procures 7.5 MT from indigenous sources including captive mines. By 2019-20, about 70 MT of coking coal will be required, of which 85 per cent will have to be imported.

6.2.3.3 The imperatives of coking coal security require that new sources of coking coal be tapped. Accordingly, the Government would aim for the coal sector to become market-driven, but in the meantime continue allocation of captive coking coal blocks to steel plants, and establish mechanisms to share their surplus resource with other steel plants. The Government would encourage joint ventures and equity participation abroad by steel and coal companies. Simultaneously, efforts would be made to develop and adapt technologies, which have synergy with the natural resource base (non-coking coal) of the country. The steel industry would be encouraged to make investments in washing and beneficiation of coal.

6.2.4 Non-Coking Coal: With proven reserves of 74 billion tonnes, non-coking coal constitutes around 82 percent of the total coal reserves in India. Production of non-coking coal at 294 MT during 2001-02 was 91 per cent of the total coal production of 328 MT. In 2004-05, the steel sector consumed about 8 MT of non-coking coal, excluding thermal coal for captive power plants.

6.2.5.1 Sponge iron grade non-coking coal: The sponge iron industry using non-coking coal as input material will play an important role in future as a substitute input for coke. The capacity of sponge iron industry would increase from the current 13 MT to 20 MT by the end of 2010-11, at a growth rate of 6.5 per cent per annum, and thereafter, till 2020, grow to 38 MT. The current trends indicate that a large number of sponge iron based steel units may come up in the states of Orissa and Jharkhand. By 2019-20 the steel industry will demand around 26 MT of non-coking coal of higher grades.

6.2.5.2 Available data show a declining rate of growth in production of non-coking coal in India. In the decade of 1980s, the growth rate was 6.5 per cent, which fell to 3.9 per cent in the 1990s. In the last five years the growth rate has been 4.7 per cent. The power plants are, therefore, planning to import large quantities of thermal coal. Further, Indian coal is high in ash content, which will force non-coking coal based steel production also to go for some imports.

6.2.5.3 While market forces should allocate resources to their most efficient uses, which would require the coal sector to be deregulated, a strategy for the transitional period would be needed. Accordingly, the sponge iron and steel industry would get first priority in the allocation of higher grades of non-coking coal of below 12 per
cent ash content, being essential feedstock. Greater flexibilities would be introduced in the form of sale of surplus coal, re-allocation of existing unused linkages with Coal India Limited, and allocation to consortia of small users. Joint ventures of public sector companies with the private sector would be explored in order to finance the required investments.

**6.2.6.1 Natural Gas:** The pricing mechanism for natural gas, taking into account the cyclical nature of the steel industry, needs to move gradually towards market-determined prices. It would also be desirable to put in place the regulatory framework, as natural gas stocks are limited in the country and sufficient level of competition has to be ensured in this sector. Further the industry needs time for adjustment as price shocks lead to loss of business confidence.

**6.2.6.2** Considering the importance of gas based steel plants due to (a) environmental cleanliness, (b) shortages of coking coal required for other major routes, and (c) natural gas being a feedstock for sponge iron plants and not just a heating source, the present system of allocation and pricing of natural gas to the steel sector would remain under continual review.

**6.2.7 Refractories:** Refractories are used to line various high temperature vessels used in the steel manufacturing process. India has a refractory industry of 80 units with 1.6 MT capacity, and utilisation of just 55 per cent in 2004-05. It needs modernising and upgrading. The Government would foster closer technical interaction between the steel industry and the refractory industry so as to achieve fewer breakdowns, reduced down time and prompt hot repairs. The Government would also support basic and applied research in utilising indigenous refractory raw materials through partnerships between steel and refractory producers.

**7. INFRASTRUCTURE**

**7.1 Inland transportation:** It is estimated that every tonne of steel production involves transportation of 4 tonnes of material. The envisaged addition of 75 MT of steel annually implies 300 MT of additional traffic. In a globally integrated economy, minimisation of the overall cost of transportation becomes an important instrument of maintaining the competitive edge in both the domestic and overseas markets.

**7.2** Table 3 below shows the year-on-year growth in gross capital formation for 'Railways' and 'Transportation by other means':
7.3.1 Railways: The railways transport iron ore and coal from mines and ports to the plants, and steel to ports and consuming areas. However, over the last decade railways has been consistently losing traffic originating in the steel sector to the roads. The share of railways in transporting finished steel has declined from 71.9 percent in 1991-92 to 34.4 percent in 2001-02. The decline has been largely on account of railway's competitive weakness in the face of challenges from other modes of transport like roads, pipeline and coastal shipping. Replacement of the 'equalized railway freight' by 'freight ceilings' is also partly responsible for the modal switch.

On the basis of the present share of railways and roads in the movement of raw materials and finished/saleable steel, the expected scenario by 2019-20 appears to be as follows:

Table 4: Modal Distribution of Traffic, 2004-05 and 2019-20

Expected traffic originating in the steel sector to be handled by the railways (MT)

<table>
<thead>
<tr>
<th></th>
<th>2004-05</th>
<th></th>
<th>2019-20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Railways</td>
<td>Road</td>
<td>Railways</td>
</tr>
<tr>
<td>Raw</td>
<td>80</td>
<td>34</td>
<td>230</td>
</tr>
<tr>
<td>Materials*</td>
<td>11</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>61</td>
<td>263</td>
</tr>
</tbody>
</table>

* Excludes traffic due to export of iron ore.

7.3.3 Based on the average lead distance over which the freight needs to be computed for raw materials for steel making and finished products, it is estimated that the total traffic generated for railways originating due to the iron and steel industry would be around 120 billion tonne kilometer by 2020. The total traffic for railways including export of iron ore will be around 150 billion tonne kilometer. This estimate, however, may change somewhat depending on the exact location of the new (green-field) plants and mines coming up in the next two decades.
7.3.4 The Railway facilities, therefore, would need to be expanded substantially in view of the renewed investor interests in the creation of additional steel capacities - both in green-field and brown-field projects. The outlay for railways as a percentage of total plan outlay has come down from 10.3 per cent (up to 4th Plan) to 6.8 per cent (10th Plan). Resource constraints may necessitate participation by the steel industry in the creation of railway infrastructure, especially in the capital-intensive areas of laying tracks and procuring wagons. Besides ensuring availability, the railways would also need to re-examine their freight structure and improve quality of services. Dedicated freight trains in the private sector would be encouraged.

7.4.1 Roads: Similarly, the existing road network needs to be expanded and strengthened considerably for reducing the transaction costs of the Indian producers. The steel plants and mines need to be integrated with the on-going programmes of national highway development and also with the proposed rural road schemes for expanding the delivery chain of steel across the country, especially the rural areas.

7.4.2 Geographical coverage of the country by road transportation remains woefully low despite the quantum jump in construction of roadways across India in the recent years. Performance of the Indian road sector is poor in terms of effective sustained velocity of movement. This is demonstrated by the fact that roads now carry an overwhelming 85 per cent of passenger traffic and 70 per cent of freight, and that highways account for around 40 per cent of this movement while making up only 2 per cent of the overall road network. The steel industry would be encouraged to create links to the nearest available highways. But the task of expanding the highway network would continue through public-private partnerships.

7.5.1 Ports: After liberalisation of the economy, the Indian steel industry has become highly dependent on port infrastructure both in terms of imports of critical input materials like coal and coke and export of saleable steel. Keeping in view the strategic goal of achieving a production of 110 MT of steel per annum and an annual export level of 26 MT by 2019-2020, the port facilities would also have to be expanded substantially. The projected bulk to be handled at ports is shown below:

<table>
<thead>
<tr>
<th></th>
<th>2004-05</th>
<th>2019-20</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Import</td>
<td>Export</td>
<td>Total</td>
</tr>
<tr>
<td>Raw Materials*</td>
<td>19.3</td>
<td>78</td>
<td>97.3</td>
</tr>
<tr>
<td>Steel</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>21.3</td>
<td>82</td>
<td>103.3</td>
</tr>
</tbody>
</table>

[Table]
7.5.2 The current Government policy allows private capital in port development. Steel producers would be encouraged to develop port and berth facilities so as to improve productivity, turn around time, capacity to handle larger vessels and other operational parameters of efficiency.

7.6 **Power:** The additional requirement of power for the steel industry would be 7,000 MW by 2019-20, requiring an additional investment of Rs. 24,500 crore. The Electricity Act, 2003 and the National Electricity Policy allow captive generation of power and trading of surplus power. This will facilitate growth of investment in captive power plants by the steel industry. At the same time the Government would encourage the industry, and the secondary sector in particular, to bring down the specific consumption of power.

7.7.1 **Financial Resources:** In order to achieve the strategic goal of 110 MT of steel production by 2019-20, the industry would need additional capital to the tune of Rs 230,000 crore. In addition, funds would be required for technological upgradation of existing facilities. However, the outstanding advances of the banking sector to the industry at the end of 2003-04 were only Rs 26,295 crore. The cost of capital in India is among the highest as shown in Table 6:

<table>
<thead>
<tr>
<th>Country</th>
<th>Cost of Capital (% per annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>1.4</td>
</tr>
<tr>
<td>USA</td>
<td>1.4</td>
</tr>
<tr>
<td>S. Korea</td>
<td>Brazil</td>
</tr>
<tr>
<td>Germany</td>
<td>4.2</td>
</tr>
<tr>
<td>Brazil</td>
<td>9.75</td>
</tr>
<tr>
<td>India</td>
<td>11</td>
</tr>
<tr>
<td>China</td>
<td>5-6</td>
</tr>
<tr>
<td>World</td>
<td>5</td>
</tr>
</tbody>
</table>


7.7.2 To mobilise such vast resources, direct foreign investment would be encouraged. In addition the external commercial borrowing norms would be reviewed periodically to facilitate smooth inflows of debt, and to bring down the cost of capital. Steel is one of the six sectors that figure in the index of industrial production for "infrastructure," but the fiscal incentives available to the infrastructure projects are not available to the steel industry. Suitable incentives would therefore be devised for the steel industry.

8. **STEEL PRICES**

8.1 Following de-regulation of prices for integrated steel plants in 1991-92, the domestic prices of steel have become market-determined. Market prices remain in step with international prices, though generally lower. During industry downturns,
prices fall and during upturns, they rise. While rationalisation of the customs and excise duty structure is aimed primarily at reducing fiscal and revenue deficits, it has an indirect influence on consumer prices. At present, there are around three thousand units manufacturing steel and steel products, which are marketed by over 100,000 traders for ultimate consumers. This dispersal of the distribution chain has been the principal reason why no price regulation of the steel trade has ever been in force. Government has recently set up a Competition Commission to look into complaints of monopolistic pricing.

8.2 Steel futures: The cyclical nature of the steel industry deters fresh investments due to risks of recession. The mismatch between demand and supply also leads to price volatility witnessed during recent times. Stagnation in steel prices for long periods followed by sudden spurt also affects the consumers and the infrastructure industry. Therefore, the efforts of various stakeholders to develop risk-hedging instruments like futures and derivatives would be supported.

9. HUMAN RESOURCES

9.1 The anticipated steel production of 110 MT by 2020 would require an additional workforce of 220,000 after accounting for the expected productivity improvements. Further the creation of 1 man-year of employment in the steel industry generates an additional 3.5 man-years of employment elsewhere in the economy due to its strong linkages with other sectors such as transport, mining, construction, machinery, and steel fabrication. The total additional employment generated in the economy due to expected production of 110 MT by 2020 would be around 1 million. 9.2 The profile of the required human resources will have a larger share of the skilled and semi-skilled labour force. It is a matter of concern that availability of scientists, engineers and technicians per thousand of population in India is 7.05 compared to 113 in Japan, 90 in U.K., 53 in Korea, 54 in Australia and 85 in Germany. Further, the task is not limited to increase in the stock of technical manpower. The technical and professional institutes of the country would also be required to impart new competencies and capabilities in tune with changes in technology and the needs of globalization. The existing training and research institutes under the Ministry of Steel would be brought under an umbrella organization with representation from each segment of the industry. The functions of this organization would include (a) suitable training programmes especially for the secondary small scale units, (b) promotion of steel consumption through dissemination of information on availability and suitability of steel for various applications, and (c) collection and analysis of data on important parameters of the industry.
10. TECHNOLOGIES, RESEARCH AND DEVELOPMENT

10.1 Though the choice of technology will be determined by entrepreneurs based on techno-economic considerations, the Government would encourage adoption of technologies, which:

- Have synergy with the natural resource endowments of the country.
- Are conducive to production of high-end and special steel required for sophisticated industrial and scientific applications.
- Minimise damage to the environment at various stages of steel making and mining.
- Optimise resource utilisation.
- Facilitate modernisation of the steel industry so as to achieve global standards of productivity and efficiency.
- Development of front end and strategic steel based materials.

10.2 India's expenditure on Research and Development has been negligible not only in absolute terms but also as a percentage of GNP at 0.86 per cent. This can be compared to the developed world with an average ratio of 2.5 per cent3. In the case of steel industry, the ratio of expenditure on R&D as a percentage of turnover is only 0.26 percent10.

10.3 The low priority to indigenous R&D has given rise to adoption of technologies that are more suited to conditions prevailing in the developed world. For example, resource position of raw materials requires development of technologies, which can use indigenous coking coals and non-coking coals and for improvement in quality of high alumina Indian iron ore. But lack of innovation and adaptation to Indian conditions is resulting in large-scale import of coking coal and low performance in iron making. Aggressive R&D efforts would, therefore, be mounted to create manufacturing capability for special types of steel, substitute coking coal, enrichment and agglomeration of iron ore fines, develop new products suited to rural needs, enhance material and energy efficiency, utilise waste, and arrest environmental degradation. Public sector steel companies would enhance R&D expenditure in the coming years to finance internal R&D efforts and sponsor outside research, which may provide a framework for inter-disciplinary cooperation with the private sector across national boundaries. Government's contribution to fostering basic and applied R&D will be enhanced.
11. ENVIRONMENTAL CONCERNS

11.1 With a view to making various operations in steel industry environment friendly, environmental audit and life cycle assessment of existing steel plants (including sponge iron units) would be encouraged so that the relevant processes reduce emissions and effluents, minimise and better manage solid waste generation, and improve resource conservation such as energy and water. There are some fine examples of high-level environmental performance in the steel sector already. However, the steel sector would join the efforts of other industries to improve environmental performance even more. The secondary steel producers would be proactively assisted in shifting to processes that are more environment-protective. A similar policy would be followed in assisting natural resource industries, such as iron ore and coal mining, where scientific mining and mineral processing would be encouraged.

12. SECONDARY AND SMALL SCALE SECTOR

12.1 The secondary sector primarily consists of non-integrated and comparatively small steel producers. However, there are large variations amongst various units in terms of scale of operations, product-mix and technology. The secondary sector plays an important role in providing employment, meeting local demand of steel in rural and semi-urban areas, and meeting the country's demand of some special products required in small volumes.

12.2 The Government will strive to provide the necessary feedstock to these units at reasonable prices from major plants through the existing mechanism of State Small Industries Corporations.

13. TRADE POLICY

13.1 Exports: It is estimated that the country will achieve an export ratio of around 25 per cent of the total production in 2019-20 from 11 per cent in 2004-05. This is comparable with a 30 percent share of exports in global production. The Government will support all efforts to make available export credit, provide trade information, and cut transaction costs in general. In view of the slow progress of multi-lateral negotiations, Government would focus on regional trade agreements to broaden the export base. Exports of value-added steel and steel products, including indirect export of steel through project exports, would be encouraged.

13.2 Imports: Import duty rates have been brought down progressively in the post-deregulation period. The Indian steel industry has been able to successfully withstand the competitive pressures of overseas producers. However, integration with
the global economy requires that the industry should be protected from unfair trade practices, which become common especially during the periods of downturn. The Government would, therefore, institute mechanisms for import surveillance, and monitor export subsidies in other countries.

14. INVESTMENT PROMOTIONS AND POLICY IMPLEMENTATION

14.1 The very nature of steel production, especially through the integrated route, requires a number of clearances of the central and state governments for investment in the steel sector. Delays at various levels not only add to project costs but also discourage fresh investments. Hence a suitable executing mechanism will be evolved to discharge the following functions:

◆ Provide a single-window clearance for large projects, to be followed by statutory clearances by the concerned ministries.

◆ Prepare and implement an action plan for achieving the strategic goal of 110 MT of steel production by 2019-20, with separate plans for the growth of flats and long products.

◆ Prepare and implement road maps for technological and productivity improvements benchmarking them to global standards.

◆ Monitor the implementation of the National Steel Policy.

◆ Conduct reviews to remove infrastructure, procedural and institutional bottlenecks and to achieve policy coordination among Central Ministries and State Governments.

Projected steel capacity expansion in India
(Million tonnes)

<table>
<thead>
<tr>
<th>Steel Producers</th>
<th>2004-05</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAIL (including IISCO)</td>
<td>12.8</td>
<td>21.4</td>
</tr>
<tr>
<td>Tata Steel (Jamshedpur)</td>
<td>4</td>
<td>7.5</td>
</tr>
<tr>
<td>Tata Steel (Orissa)</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Tata Steel (Jharkhand)</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Tata Steel (Chhattisgarh)</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>RINL</td>
<td>3</td>
<td>6.8</td>
</tr>
<tr>
<td>Essar (Hazira)</td>
<td>2.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Essar (Orissa)</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Steel Producers</td>
<td>2004-05</td>
<td>2011-12</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Essar (Jharkhand)</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>JSW Steel</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Ispat</td>
<td>2</td>
<td>3.6</td>
</tr>
<tr>
<td>Ispat (Orissa)</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Bhushan</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>JSPL (Orissa)</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>JSPL (Jharkhand)</td>
<td>-</td>
<td>3.6</td>
</tr>
<tr>
<td>Mittal Steel</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>POSCO</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>EAF+IF</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Total crude steel capacity</td>
<td>38</td>
<td>122</td>
</tr>
</tbody>
</table>

(Source: Media reports)

**Stainless stock**

SAIL's Salem Steel Plant (SSP) had successfully developed a special variety of stainless steel, known as 409M grade, with excellent atmospheric corrosion and wear resistance. This steel grade is characterised by its high yield strength, very good cold band ability and oxidation resistance at moderately high temperature. It has been widely used by the Indian Railways for the manufacture of BQXNCR wagons used for transporting iron ore. The different parts made from 409M grade are box body (including the inner and outer walls, floor plate and wagon under-frame), vertical side stanchions and flab doors. In the last six years, SSP has supplied over 12,000 tonnes of stainless steel to the Railways in different grades and finishes.

Initially built with wood, railway coaches are now made with a steel body. Indian Railways started using stainless steel after persuasion by SSP and several rounds of field studies. The Integral Coach Factory, Chennai the pioneer in using stainless steel, continues to use stainless steel for applications ranging from structural (trough floor) to hygiene. The Railways are now looking at lighter and paint-free stainless steel coaches to prevent corrosion and lighten weight. The Rail Coach Factory/Kapurthala has entered into a technological agreement with LHB/ Germany, which provides access to designs and expertise for building lightweight coaches. RDSO/ Lucknow, after taking the views of SSP, has developed the material specified for these railway coaches.
SSP has recently supplied samples for full stainless steel coach bodies to Bharat Earth Movers Ltd (BEML/Bangalore, which currently sources fabricated parts from ROTEM/South Korea and assembles them for supply to the Delhi Metro Rail Corp./New Delhi. After studying the material requirement and designing the process plan for achieving the desired mechanical properties, a detailed trial quality plan was made by SSP indicating the thickness tolerance requirement and other process parameters like speed and temperature. Close monitoring was done on the trial processing and samples were cut in the required specification of BEML. Extensive testing was undertaken by BEML on the sheets supplied on trial basis at reputed laboratory. SSP has also developed special finishes - Moonrock, Honkorkom, Macromatt, Stripe finish, etc. - in various grades of stainless steel, which are widely used in aesthetic application. Railways also stepped forward in using such finishes in Rajdhani, Jan Shatabdis, electric trains, etc. This material demands superior surface finish and specified mechanical properties.

In view of the incidence of fires, Railways is in the process of making fire retardant coaches. The design evolved the requirement of stainless steel in 0.5 mm thickness in various special finishes. The various requirements of such special finishes are flatness and a dull surface. Material with such critical requirement was developed in various finishes like Frondz, Aqualine, Fabrique and Mystique.

**Profit at Rs. 1,127 crore**

SAIL achieved highest ever High (first half) profit before tax of Rs 3,408 crore for 2005-06, a growth of 12.5% over the corresponding period last year (CPLY) backed by best-ever physical performance in hot metal, crude steel and saleable production. SAIL's unaudited financial results for April-September 2005 were taken on record by the company's board of directors on 27 October 2005. The profit before tax for the second quarter at around Rs 1,707 crore, however, declined by 6.4% over CPLY mainly because of increase in price of indigenous and imported coal and reduction in net sales realisation.

The steel major recorded higher sales turnover at Rs 7,889 crore with a growth of 6.7% over CPLY. However, a net profit (after tax) of Rs 1,127 crore in Q2 of current fiscal is lower by Rs 386 crore over CPLY mainly due to higher tax provision. In the previous year, in view of brought forward losses, unabsorbed depreciation and other relief available under the Income Tax Act, the company did not have taxable income and only minimum tax on book profits was provided under the Income Tax Act. SAIL is now providing regular tax liability. There is higher tax provision of Rs 270 crore.
during the second quarter. SAIL’s net profit after tax amounted to Rs 2,251 crore during Hi against Rs 2,625 crore recorded during CPLY.

While steel companies are faced with the impact of softening of international steel prices, and sharp increase in input prices -mainly coking coal, SAIL could maintain its performance by significantly improving its physical parameters.

Production of saleable steel increased by 11% during April-September 2005. Average capacity utilisation of plants was about 105 % during the period. Production through the energy efficient continuous cast route has gone up by 4% during the first six months of 2005-06 over CPLY. The energy consumption came down by 3% to 7.23 Gcal/tcs during the period. The coke rate has also come down by 5 kg/thm and the blast furnace productivity has gone up from 1.43 to 1.51 tonnes/cum/day during the period. While recording highest ever production of saleable steel, SAIL reduced its manpower by over 2,000 with an improvement of 6% in the labour productivity during the year.

SAIL’s debt equity ratio further improved to the level of 0.42:1 as against 0.58:1 at the beginning of the financial year. Overall debt has further come down by Rs 565 crore in Hi and the company continues to be virtually debt-free considering the deposits in hand.

Commenting on the company’s performance during the first half of 2005-06, Mr V.S. Jain, Chairman, SAIL said, "SAIL today is on a strong footing and is going ahead with steady expansion plan to compete with the best in the steel market."

Following impending merger of IISCO, the capacity of SAIL will expand to 22.5 million tonne (MT) of hot metal production by 2011-12. In pursuit of its Corporate Plan-2012, SAIL already has initiated capital schemes worth over Rs 3,500 crore which are at various stages of implementation. This is a part of the overall capital outlay plan of Rs 35,000 crore by 2011-12.

Some of the recently completed schemes are upgradation of BF-4 and ERW pipe plant at Rourkela, cast house slag granulation plant at Rourkela, coal dust injection at Bokaro and Bhilai and coal tar injection at Durgapur. Other major schemes in the pipeline include installation of bloom caster and associated facilities at DSP, installation of new slab caster at BSP, revamping Mae-West block system of hot strip mill at BSL and rebuilding coke oven batteries at Bhilai, Bokaro and Rourkela Steel Plants. A systematic plan for upgradation of blast furnaces in all the plants is being taken up to improve blast furnace productivity.
National award for SAIL R & D

The research & development wing of SAIL has been conferred the coveted 'National Award for R&D Efforts in Industry 2005 in New Materials' by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Govt of India. SAIL's Research & Development Centre for Iron & Steel (RDCIS), headquartered at Ranchi, bagged the honour for its pioneering contributions in the arena of design, development and application of new special steel products to meet the stringent requirements of various market segments.

The key technological innovations of RDCIS include development of low-carbon extra deep drawing steel with superior formability for auto segment, titanium bearing LPG-grade HR coils with minimum strain aging for cylinder manufacture, SAE 1070 and SAIL boron billets with better wear resistance index for tractor disc application, and SAIL-HITEN 690 AR grade plates with high strength and ductility for ATM chest fabrication. SAIL boron and SAIL-HITEN grades of steel have been developed for the first time in the country facilitating both import substitution and export promotion. RDCIS also achieved a major breakthrough by becoming the first research unit in the country to design and develop a prototype noise barrier for highways.

SSP leads in National Quality Competition

Salem Steel Plant (SSP) has won the 1st prize in the National Quality Competition 2005 organised by the Indian Institute of Metals in the pig iron/DR unit/major rerolling mill category. The award was presented by Dr Manoranjan, Secy/Ministry of Steel, during the National Metallurgists' Day celebrations held at Chennai on 14 November 2005. This was the ninth time in 14 years that SSP had bagged the IIM prize.

BSP, RSP bag Greentech Gold award

Bhilai Steel Plant (BSP) and Rourkela Steel Plant (RSP) bagged the prestigious Greentech Environment Excellence Gold Award in the metal sector, for the second year in succession. The award was given to both the plants by the Green Tech Foundation, for their outstanding achievements in the area of environment management and pollution control. The awards were given at the 6th Annual International Conference and Exhibition on 'Environment Management' held at Goa on 22 October 2005.
OBJECTIVES

Steel is considered as the backbone of the economy of any Nation and we are the "Steel Makers of Our Nation". We have challenges ahead and those are of revival, survival, growth and prosperity under the global competitive environment. Having full faith on the strength of our human resource we have accepted the challenge.

The objectives of research programme is to orient the new economic trend & enrich the SAIL organization in the steel sector. This research programme will help to appreciate the vision and organisational objectives of our company. I am sure at the end of the research you will definitely integrate my objectives with that of the organisational objectives of SAIL.

The steel industry continues to capture the headlines. New production capacities are being set up, established players are enlarging their empires through mergers and acquisitions, and almost every major steel company across the world is expanding operations. While the global steel scenario is throbbing with activity, there is a major shift of attention towards Asea, mainly China and India. The footprints of global majors, like POSCO and Mittal Steels are already being seen in India. At the same time, the Indian Steel industry with a presence in different states is also planning expansion and new capacities.

SAIL, too, has responded to the change in the business environment, although our approach has been slightly different. Our accent has been on tapping the full potential of all our assets to the optimum level. There is a huge possibility for expanding our business through this route in the most cost-effective manner. Today, we have substantial competitive advantages over others. Firstly, we have the required infrastructure in each of our operating units and there is scope for steadily enhancing capacity and operations in each of our production centres. Secondly, we have by now built a very strong financial foundation and the company is virtually debt free. This gives us the strength for investing in our expansion projects mainly through internal accruals. Thirdly we have an edge over others in having the most experienced and trained manpower adept in the skill of steelmaking. And, lastly, we have a marketing network that covers every nook and corner of the country which can be duly tuned to cater to expanded production.
Our growth plan of achieving hot metal capacity of 20 million tonnes by 2011-12 has taken all this in view. The plan has also been kept flexible enough for adjustment to be made if the market conditions require us to do so. For instance, we have kept our options open on adding to our capacity through mergers and acquisitions.

Signs of strong demand have been perceptible in the global steel market since August 2005. The domestic market has also been witnessing steady growth of demand riding on the back of a robust growth of GDP around 7%. In the dynamic environment of the steel industry today we need to move with speed and determination to stay ahead of others. With the present trend of the global economy growing more than 4% annually, the environment is expected to remain most congenial for the growth of the steel industry. As we look ahead, the market looks poised for even more upward movement in the coming months.

While a growing steel market has opened new opportunities for the steel industry, the unprecedentated rise in the prices of raw materials like coal and other vital inputs has exerted tremendous pressure on the bottomlines of steel producers. SAIL has taken a number of initiatives to ensure coking coal supplies on a sustained basis for meeting its current and future growth plans.

**Hypothesis**

SAIL is large corporate entity with many fascinating facets. Joining as a front-line manager in SAIL, we have great opportunities ahead to discover ourself in the process of supporting the performance of the company.

SAIL has manifested in its activities a firm conviction that effective management of change is the key to growth and prosperity in an increasingly competitive market. Since a decade and a half many steps have been taken to keep pace with the changing times. The vision statement of SAIL appropriately highlights the challenges in business environment.

"To prosper in business by achieving international competitiveness through satisfaction of customer need by continual improvement in quality, cost and delivery of products and services".
To achieve this vision it is essential that every unit of this organisation should internalise the Vision and exemplify it in our actions. The central induction programme is aimed at providing an overview of SAIL, its vision, its culture and major issues facing the organisation.

In this view era as we are advancing on the road to competitiveness in terms of quality, cost and service, a tough competitive spirit is necessary to attain these goals. With single-minded devotion, we must contribute our best towards every aspect of organizational identity and generate surplus through higher efficiency and reduce wastage and generate profit.

The iron will to survive against odds and script a spectacular turnaround has paid rich dividends for the SAIL collective. Record net profit has laid firm platform on which we can stand with our head held high and look forward to be counted as one among the top performers in the industrial arena of the country. With record achievements in production, sales, exports, techno-economic parameters and financial performance. The SAIL collective deserves the credit for all that was achieved. One of the major achievements has been the strengthening of the financial foundation for the organisation.

The task ahead is daunting for us since we have set a target of reaching a hot metal production level of 20 million tonnes by the year 2011-12. This calls for a lot of micro-planning and the involvement of all the employees for moving towards the target as per plan. There were times when the given capacity to produce was taken as sacrosanct. By opting for innovative ways, have now proved that nameplate capacities do not have much significance and SAIL have been able to operate the facilities in major units above the rated capacities. Attempt to realise the full potential from the existing assets and resources will continue as SAIL work further on implementing measures for future expansion.

In a dynamic situation, sudden emergence of hurdles and hiccups are likely from time to time. Going by the cyclic nature of the steel industry and depending on the economic scenario in China and other countries, SAIL may expect ups and downs. SAIL needs to keep alert to tackle such situations while pursuing our goal.
NEW INITIATIVE

At the corporate level, certain initiatives have been taken to encash on the opportunities available to us so as to improve the medium-and long-term prospects of the company. SAIL are hopeful that very soon our proposal for capital restructuring would be approved. SAIL also plan to spin off non-core units, dispose off idle assets, close uneconomic units and complete the join venture formalities which have already begun, so that value addition in different areas can be immediately obtained. SAIL have also been able to open up the west Asian market for our exports consequent to the collapse of the South East Asian economy. SAIL are very confident of getting quick results as well as long term benefit. The formation of our Navratna Board will also help us to take decisions more quickly.

Besides these dynamic moves, the company recently participated in a brainstorming workshop to evolve the future direction for the organisation. Three priority areas have been identified as focal points for future development of the company. These include developing employees with potential as 'drivers' of excellence who would steer the company to greater heights and contribute towards attaining excellence in operations and other spheres. Secondly, the need for fundamental change in our decision making culture was identified. This is to be developed with behavioural changes like self-discipline, positive mind frame and harmonious blend of strategic thinking and action orientation. Thirdly, in the context of growth and development, the organisation has to prepare itself for managing change in environment and expectations of various stakeholders.

In a nutshell, company effort has been to accelerate the change process proactively so as to meet the future challenges. SAIL has miles to cover to achieve the ultimate success - to be a respected world-class corporation. This is the most opportune time to regenerate our strength since the steel industry is not only buoyant but is expected to gain strength over the next few years. Being the major steel producer in the country, SAIL has a responsibility to use our potential to the utmost to bridge the existing demand-supply gap. Sail skilled, experienced and dedicated workforce is SAIL fundamental strength.
SAIL have just been witnessing an astronomical rise in prices of inputs and constraints in availability of coking coal, which surfaced after a slight upturn in the business cycle for the steel industry. With sheer determination SAIL could locate opportunities in such threats. With the help of Research & Development Centre SAIL have launched the attempt for coal dust injection, use of coal and petroleum tar as well as sponge iron in innovative technologies for bringing down dependence on coal. These measures are likely to bring the substantial benefits in the long run.

As SAIL has to ahead with plans we are likely to face further challenges like infrastructural constraints. We have to keep overcoming all such deterrents with the same iron will which has to remain a winner against all odds. We have to reaffirm our faith in the ability and our 'attitude will determine SAIL altitude'.

(CHALLENGES & OPPORTUNITIES OF SAIL)

In the proposed research work I have discussed the declining fortunes of the Indian steel industry over the past two years. That the situation has not changed very much is evident from our results, which are far from satisfactory. Severe pressures continue to affect our fortunes and, indeed, that of the entire steel industry in the country. This implies that the challenges ahead continue to remain very strong. However, SAIL have always been able to convert challenges into opportunities.

Today, therefore, I will discuss with you the challenges ahead and the opportunities being thrown our way by them. It goes without saying that SAIL have to recognise these challenges and take advantage of the opportunities to emerge a fighting fit organisation in the times ahead.

◆ Project in the infrastructure area did not take off. These include projects in various sectors, including power, housing, roads and buildings, shipping and railways. Besides the above, construction activities in general for building of industrial sheds and factories have just not materialised.

◆ New entrants in the steel industry have started throwing into the market products made through the latest technologies at lower operating costs.

◆ The collapse of the South-East Asian market, which continues to show no signs of recovery, is now further snowballing into affecting the American and European markets. This has led to heavy dumping of steel into the devel-
oped and the developing countries, the most prominent example being hot-rolled coils which are landing at extremely low prices.

- A number of measures were announced by the Union Government for investing in the infrastructure area. Various committees and sub-committees are working to tie up all arrangements and work out modus operandi. However, no project is anywhere near the take off stage and we expect that if things start moving, it will be not later than the end of the current fiscal.

- Due to the above reasons and the downturn in the Indian economy, not only SAIL but the entire steel industry suffered extensively this year. Since the market was not picking up and availability of steel was higher than the demand, even domestic producers have been undercutting each other to the extent that practically all steel producers have been selling their products within the country at or around their variable costs, sometimes even lower.

- The cost of capitalisation of our modernised units and interest on borrowing made to fund our modernisation programme is huge. As a result of poor net sales realisation because of the tremendous competition, our income has been lower than the outgo.

- The above being the scenario prudence demands that having taken stock of the situation, we devise ways and means to overcome the same and move ahead in other areas. Opportunities that are arising out of the above situation can be converted into strengths which will lead us to a more efficient and profitable organisation.

- One such opportunity is to make quality products as, even in the depressed market, a customer who has a wider choice of products would ultimately buy from a supplier which produces quality products. This also leads us into producing the quality product at a much reduced cost which we can, by utilising to the maximum the modernised facilities at our plants. It is time for us to get the maximum benefits from these units which are now geared to produce quality. Completing this, the need of the hour should be total concentration on avoiding wastage in each and every area of operations and containing costs to the barest minimum possible.
Research Design

A research design or model indicates a plan of action to be carried out in connection with a proposed research work. The design may be a specific presentation of the various steps in the process of research. These steps include the selection of a research problem, the presentation of the problem, the formulation of the hypothesis, conceptual clarity, methodology, survey of literature and documentation, bibliography, data collection, testing of the hypothesis, interpretation, presentation and report writing.

Research Design is a catalogue of the various phases and facts relating to the formulation of a research effort. It is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy.

The research design constitutes the blueprint for the collection, measurement and analysis of data. Research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. The plan is the overall scheme or programme of research. It includes an outline of what the investigator will do from writing the hypotheses and their operational implications to the final analysis of the data.

The sources of information are generally classified as primary and secondary. The following grouping is convenient: (i) Documentary sources, (ii) Observation, (iii) Observation, (iii) Mail Questionnaire (iv) Interviewing.

While the above grouping is a useful classification for discussion, it should not be thought to imply that the methods cannot be combined. Indeed a combination of methods is often appropriate to make use of their different strengths.
Primary data refers to information that is generated to meet the specific requirements of the investigation at hand. On the other hand, secondary data is information that is collected for a purpose other than to solve the specific problem under investigation.

There are two broad categories of secondary data – internal secondary data and external secondary data.

Internal Secondary Data. Internal (secondary) data refers to information that already exists within the company in which the research problem arises.

External Secondary Data. External (secondary) data refers to information which is collected by a source external to the firm (whose major purpose is not the solution of the particular research problem facing the firm). There are three major categories of external data:

1. Government sources and publications
2. Business reference sources
3. Commercial agencies

The regular user of secondary information often develops a healthy skepticism about information provided by others. There are many ways that data may be misleading if they are not evaluated carefully. No data should be used without careful evaluation, and data obtained from secondary sources require especially close scrutiny.

The evaluation of secondary data should follow the same procedures employed in the evaluation of primary data. Questions concerning the source(s) of the data, measures used, the time of data collection and the appropriateness of analyses and conclusions should be raised routinely.

The quality of secondary data can not be evaluated without knowledge of the methodology employed when collecting the data. Information response rates, experimental procedures, validation efforts, questionnaires, interview guides or protocol’s and analytic methods should be available in sufficient detail to allow a knowledgeable critique of the data collection procedure. Copies of measureable critique of the data collection procedure. Copies of measurement instruments, questionnaires, coding forms, and the like help identity what information was actually obtained and how it was obtained. Any experimental or field procedures employed should be described in detail. For example in a study of consumer reactions to a new product, it would be useful to know whether it was simply described to them.

Let’s upturn the downturn: The groundwork for achievement of this goal already exists. We put it in place, brick by brick, in the face of the most difficult conditions, during the last few years. Out determined efforts to save cost of operations have helped us to produce more with less. Productivity is also increasing as a direct result of our continuing thrust on manpower rationalization along with better process management. Quality of products has improved manifold with the modernized production facilities yielding desired benefits. All these factors were reflected in SAIL substantially improved performance in the first half of the current financial year, and the trends of the just-completed third quarter.
All units of SAIL have been an integral part of this Herculean endeavour to effect a turnaround in the fortunes of SAIL. Today with the market, too, providing timely support, the time has come for each to intensify efforts in the individual areas of work. A determined last thrust will help us accomplish it. The areas that requires attention are very clear-

- Incremental improvement by about 10% by exploiting the full potential of our resources and through improved technological parameters, to contribute Rs.1000 crore to SAIL’s bottomline. The scope for this exists, and with determined effort the desired results can surely be achieved.
- Establishing brand equity firmly by becoming the preferred choice of customers. Fine tuning production, product quality and adhering to delivery schedules for maximum customer satisfaction.
- Ensuring safe work conditions and eliminating oversights leading to accident, costly in terms of human lives and damage of plant and machinery.

SAIL has proved to be a shining example of what commitment, determination and pro-activeness can accomplish even in the worst of times. As to approach goal of turnaround, let us not become complacent and rest on the achievements so far.

Let us also not forget that we operate in a business environment which is cyclical and unpredictable. We recognize that change is inevitable. Hence, we must make SAIL stronger from within so that it can withstand the vagaries of the system.

Company have an enviable skill base in our collective. SAIL have the potential and the ability to reach greater heights. And now also have the opportunity to put SAIL back on the path of sustained profitability and growth. Strike the iron while it is hot. By stepping up efforts to supply quality products at competitive prices, by maintaining strict delivery schedules, and by continuing the cost saving efforts.

SAIL have just been witnessing an astronomical rise in prices of inputs and constraints in availability of coking coal, which surfaced after a slight upturn in the business cycle for the steel industry. With sheer determination SAIL could locate opportunities in such threats. With the help of Research & Development Centre SAIL have launched the attempt for coal dust injection, use of coal and petroleum tar as well as sponge iron in innovative technologies for bringing down dependence on coal. These measures are likely to bring the substantial benefits in the long run.

As SAIL has to ahead with plans we are likely to face further challenges like infrastructural constraints. We have to keep overcoming all such deterrents with the same iron will which has to remain a winner against all odds. We have to reaffirm our faith in the ability and our ' attitude will determine SAIL altitude'.

52