Abstract –

Kolhapur, known in religious circles as Dakshin Kashi, is fast growing as a city and shows early potential of becoming a million plus urban conglomeration within the current decade (2011-2020). Kolhapur is now a world class foundry cluster supplying the best quality spares, mainly to domestic automobile industry and internationally to shipping and submarines as well as automobile units abroad. Kolhapur is a world class centre for manufacture of state of the art printing machinery. With the growth of Kagal-Hupari 5 star MIDC, Kolhapur is now acquiring a face of a modern, dynamic industrial centre. But this foundry industry have some challenges. These challenges were recognized through survey. This paper elaborates on capacity of utilization and managerial problems of Kolhapur foundry industry. We suggest some remedial majors to owners and managers to tackle the problems

1. Introduction

The Indian metal casting industry is as old as the Indian civilization and its primordial manifestations were found in the religious figures like 'Natraja', the dancing deity. The root of modern metal casting industry was laid in the year 1850 and grew with the development of the engineering sector.

A foundry is a factory that produces metal castings. Metals are cast into shapes by melting them into a liquid, pouring the metal in a moulded, and removing the moulded material or casting after the metal has solidified as it cools.

The most common metals to be processed are Aluminum and Cast Iron. However, other metals, such as Steel, Magnesium, Copper, Tin, and Zinc, are also used to produce castings in foundries.

1.1. Indian scenario

The impetus to Foundry Sector in India was given by Jute Industry in Bengal and Cotton Industry in Mumbai in late 19th century. The establishment of TISCO, Bengal Iron Company and IISCO was led to a remarkable use of castings in both domestic and Industrial Area. It is estimated around 7000 Foundries are operating all over India with a total casting output of approximately 3 million tones consisting of 2.36 million tones of Iron casting 4,00,000 tones of steel castings 2,68,000 tones of malleable and SG Iron castings and 20,000 tones of Non ferrous castings. The annual production is worth of Rs. 10,000 crores. India is one of the leading producer of castings in the world. The Foundry units in India are mostly located in clusters, notable among them are Howrah, Rajkot, Agra, Jamnagar, Belgum, Kolhapur, Coimbatur and Hyderabad. A number of units ranges from 100 to 700 at different foundry cluster. The foundry produce a wide variety of castings used in Automobile Industry, Flour Mill...
Parts & Components, Electric Motor, Manhole Covers, Oil engine, Pump sets, Sanitary items, Pipe and Pipe fittings, Sugar Machinery etc.

The production of different castings is as follows -

- Grey Iron: 72%
- Steel Castings: 10%
- SG Iron: 10%
- Aluminum: 8%

The industry has witnessed an average growth rate during the period 1993-1999 when production grew from 157615 to 3240000. India has exported castings worth USD131.35 Million and sanitary castings worth USD 55.39 in 1999-2000, mainly to USA and Europe.

(Source - Indian Institute foundry web side)

1.2. Foundry Cluster: Kolhapur

Kolhapur, located in the state of Maharashtra, is an important foundry cluster for automotive castings. Historically, the foundry cluster came up to cater to the casting requirements of the local industries like oil engine manufacturing, sugar mills and machine tool industry.

There are about 250 foundry units at Kolhapur. The geographical spread of the cluster includes Kolhapur, Sangli, Ichalkaranji and Hatkanangale areas. A significant percentage of foundry units (about 25%) at Kolhapur are exporting castings. The foundry units cater to a wide range of end-use sectors, as can be seen from the following table.

<table>
<thead>
<tr>
<th>End-Use Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive/oil engines</td>
<td>42%</td>
</tr>
<tr>
<td>Pumps/valves</td>
<td>17%</td>
</tr>
<tr>
<td>Sugar industry</td>
<td>6%</td>
</tr>
<tr>
<td>Tractor parts/agricultural implements</td>
<td>4%</td>
</tr>
<tr>
<td>Others</td>
<td>31%</td>
</tr>
</tbody>
</table>

(Source - Indian Institute foundry web side)
Cupola is the predominant melting furnace employed by about 75% of the foundry units. The majority of cupolas in the cluster are of conventional type. Divided blast cupola (DBC) can be found in some of the foundry units. Most of the foundries use low ash coke. A number of foundry units (about 40%) have electric induction furnace, which is used to manufacture graded castings and for duplexing with cupola.

**Center's nod to foundry cluster in Kolhapur** Mar 29, 2010 source (2*)

The Union government has cleared a foundry and an engineering cluster scheme for the engineering sector in the district. A total of Rs35.20 crore would be spent on the formation of this cluster. Of the total outlay, 20% contribution will come from the industry. The scheme would involve LK Akkiwate Industrial Estate, Jaysingpur (Rs9.80 crore), Chhatrapati Shahu Industrial Estate, Shirol (Rs6.26 crore), Shiroli Manufacturers' Association of Kolhapur, Gokul Shirgaon Manufacturers’ Association and Kolhapur Engineering Association (Rs19.4 crore). The scheme was pending for the past seven years.

"The initial scheme was of around Rs70 crore. A few months ago, a revised plan of Rs35.20 crore was submitted which got the Centre's clearance," KEA director Shrikant Dudhane told DNA.

The Centre will release its part of the funds in proportionate with the contribution paid by the industry in different phases. The actual work will start in three months.

Dudhane said Kolhapur Engineering and Foundry Cluster Private Limited was formed for monitoring the scheme. Under this company, the respective industry associations will look after the project within their limits.

The sand reclamation project, common facility centre, computer-aided design & manufacturing (CAD/CAM) centre, and a laboratory will be the major projects in the scheme.

There are a total of 4,000 machine shops and 200-odd foundries in the district. "The engineering sector is one of the core strengths of the district's economy. Better facilities will be available for the engineering sector now due to this scheme," Dudhane said.

He added the Hatkanangle constituency's MP and Swabhimani Shetkari Sanghatana leader Raju Shetty and Kolhapur South Congress MLA Satej Patil played crucial roles for the approval of this scheme.

2. Methodology

2.1 Objectives of The Study:

The present research endeavor has the following objectives:

a) To study the actual and utilized capacity of foundry industry in Kolhapur
b) To examine management activity & management issue of foundry industry
c) To suggest remedial measures for efficient administration of foundry industry
2.2 **Methodology Adopted:**

To fulfill the objectives, collection of both primary and secondary data was done. Primary data was collected through survey method, by personally visiting the identified respondents and administrating the schedule. Similarly, informal discussions were carried out with owners/managers of foundry industry so as to have an insight into the study. Observation method too has been adopted.

2.3 **Source of Data Collection:**

The data was collected with the help or primary as well as secondary source. The primary source constituted of a separate questionnaire to foundry owners/managers. The secondary source of information comprises of Government publish source as well as the internet source.

2.4 **Sample Design:**

The sample selected for the study constitutes of 21 owners/managers. Considering geographical area of Kolhapur, locality and business dealings, the researcher arrived at 21 such owners/managers worth considering for present study. The selection of the owners/managers sample was based on quota convenience sampling technique. A quota of 98 and 21 sample size was decided. The researcher visited 21 foundry units and administrated a questionnaire. The researcher approached the client and sought the willingness to participate in the study, those who refused were dropped.

2.5 **Significance of the Study:**

Kolhapur is situated at such a place which is geographically central point of South Maharashtra, North Karnataka, Konkan & Goa. Kolhapur is connected with Mumbai, Panji & other major cities with express highway, railway & airlines. Atmospheric condition of Kolhapur is healthy & not extreme. There are number of dams constructed on various rivers at west side of Kolhapur District.

Due to such excellent atmospheric & geographical conditions, Agro based Industry, Textile Industry; Mechanical industry has developed in Kolhapur. Vis-à-vis Shiroli MIDC, Gokulshigon MIDC, Kagal Hatkalgale five star MIDC. Hence the future of foundry industry is very bright in Kolhapur District. This study will be helpful for foundry owners and managers, to develop their foundry business systematically.

2.6 **Scope of the study:**

The geographical scope of the present study constitute the Kolhapur MIDC Area of Maharashtra state. The present study is restricted for “Case Study of Foundry Industry in Kolhapur.”

2.7 **Data Analysis and Interpretation:**

All completed questionnaires after the surveys were scrutinized and tables, graphs and chart were prepared. Percentages were calculated in order to get accurate picture of facts.
3. Results and Discussions (3*)

The researcher has attempted to arrive at the conclusions and suggestions which are based the data collected. A separate questionnaire was administered for owners and manager. Following conclusions have been drawn.

Majority of the owners and manager of foundry industry are of the age of 31 to 50 years and are qualified up to graduate as well as post graduate level. Most owners are having non technical qualification.

International standard organization, ISO-9000, ISO-9001, ISO-9002, ISO 14001 provide international standards for quality management and quality assurance certificate. It improve quality image of company. But qualifying for ISO certification is a lengthy process and hence many foundry units i.e. 52% do not have ISO certification. Table No 2(Source Survey data)

<table>
<thead>
<tr>
<th>International standards for quality</th>
<th>No of Respondent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td>YES</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

Above data represent that 48% respondent firms produce Less than 100 MT per month, 24% respondent firms produce 300 MT per month, 19% respondent firms produce 500 MT per month, 10% respondent firms produce 700 MT per month.

Maximum number of respondent firms produces Less than 100 MT per month in Kolhapur. The foundry industry of Kolhapur is dominated by small or medium scale organization.

<table>
<thead>
<tr>
<th>Utilization of Capacity</th>
<th>No of Respondent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60%</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>70%</td>
<td>15</td>
<td>71</td>
</tr>
<tr>
<td>80%</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>90%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>more than 90%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

Table No 3(Source Survey data)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>No of Respondent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100 MT</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>300 MT</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>500MT</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>700MT</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>1000MT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>more than 1000MT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>
Lot of Issues are involved in foundry related to functional area as per following categorization:

**Technological issues**
- a. Raw material Characterization - testing of raw material
- b. Awareness about the standards of BIS, ASTM & BS with regard to raw material and final products
- c. Vast Improvement scope in foundry practices
- d. Methodizing systems
- e. Conservation of energy
- f. Introduction of Divided Blast Cupola
- g. Waste minimization
- h. Pollution norms

**Managerial issues**
1. Formal Management Skills required
2. Introduction of Management Information systems
3. Training of Executives, supervisors and workmen
4. Benchmarking with other foundry industries

**Financial Issues**

a. Managing the working capital  
b. Promotion of Bill culture  
c. Introduction of new working capital instruments e.g. JIT inventory  
d. Cost reduction across the board through bulk purchases of raw material and joint-marketing

**Marketing Issues**

1. Pricing of products  
2. Scouting of domestic and export markets  
3. Participation in Buyers-Sellers meets in domestic and export markets  
4. After sales service to the customers

<table>
<thead>
<tr>
<th>Marketing Issues</th>
<th>No of Respondent</th>
<th>Percent</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing of products</td>
<td>17</td>
<td>81</td>
<td>1</td>
</tr>
<tr>
<td>Participation in Buyers-Sellers meets in domestic</td>
<td>12</td>
<td>57</td>
<td>2</td>
</tr>
<tr>
<td>and export markets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scouting of domestic and export markets</td>
<td>8</td>
<td>38</td>
<td>3</td>
</tr>
<tr>
<td>After sales service to the customers</td>
<td>3</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>
R&D Issues
1. Characterisation of raw materials
2. Preparation of manual on Foundry practices
3. Prototype Development

On the basis of observation the researcher infers that:
1) There is lack of long term planning.
2) Foundry units adopt traditional method for selection of workers and employees.
3) There is a severe lack of co-ordination among the employees and their work as well as in staff
4) Lot maintenance work in foundry industry

4. Conclusions:
International standard organization ISO improves quality image of company, it gives marketing advantage. ISO improves efficiency, reduces wastage, and ensures customers satisfaction. Hence it would be recommended that all those foundry units who do not have ISO certification should immediately go for acquiring the certification. In 21st century ISO certification is a must.

There are so many advantages of membership of any association with the registration of such association; builders get information of so many things e.g. new changes in market, information about new technique launched in the market. There are plenty of seminars conducted which are helpful for development. As a member of such association, owners and manager get invitation of so many exhibition and seminars which is helpful to adopt changes or adopt new things for development of the firm. So, maximum owners and manager should get registration of such association.

Testing lab is necessary for every firm. For quality work there is a need to test many materials in advance. Establishment of Spectrometer testing lab in the firm is so costly. But so many private approved testing labs are available. Some owners and manager who cannot afford to set up own testing labs must avail the facility of using private approved laboratories.

A large foundry project must be maintained properly to carry out the quality work as per the requirement of the clients to avoid unpleasant situation and misunderstanding with the clients.

Owners and manager must plan for deciding objectives, strategies, policies, programmes and procedures of foundry activity, with selection of long term plan. Purchase department plays very important contribution towards company’s profit, which is responsible for procurement of materials. Purchase department should carry out following activities –

i) Market survey of new materials
ii) Maintaining continuity of supply of material required for foundry
iii) Maintain standards in quality of purchased material
iv) Control total inventory.
The small owners and manager must change their traditional method of selection of candidates. They should select candidate as per job analysis. To improve the work efficiency and effectiveness the newly recruited employees should be trained and put on the right job.

SOURCE
*1) Diagnostic Study Sme Foundry Clusterhyderabad (Andhra Pradesh)
*2) www.beeindia.in/.../Target%20Clusters/Kolhapur%20-%20Foundries
*3) Survey data (All data, table ,graphs form the survey data of writer )

References :
2. 2.JHA S. M., Service Marketing,Himalaya Publishing House.
3. 3.Kotler P;(1985) , 6th Edn, Marketing Management (Analysis Planning Implementation
5. Pradeep K; Fundamentals of Marketing Management
7. 6.Zeithaml V.A; Bitner M.J; Service Marketing, Integrating Customer Focus A Cross the Firms, Tata McGraw – Hill Edition,
9. Journal of Indian Institute of Foundry
10. Web Side
   - www. IIF.com
   - www.midc.com
   - www.beeindia.in
   - www.foundrysolution.com