Chapter IV

Human Resource Planning in BHEL, Trichy
One of the hall marks of modern Management is the ability to plan. Manpower planning means forecasting or predicting the number of people whom the organisation will have to raise, or promote in a given period. Broadly defined, Manpower planning represents a systems approach to personnel management in which the emphasis is on inter-relationship among various personnel, personnel, policies and programmes. This contrasts with the more traditional piecemeal approach concerned with selection, training, promotion and the various related but compartmentalised functions.

Manpower or the human resource may be thought of as the total knowledge, skills, creative abilities, talents and aptitudes of an organisation's workforce
as well as the values, attitudes and benefits of an individual involved.\(^1\)

It is the sum total of inherent abilities, acquired knowledge and skills represented by the talents and aptitudes of an organisation's work force as well as the values, and aptitudes of the employed persons.\(^2\)

Of all the 'M's in the management (i.e., Materials, Machines, Methods, Money and Motive power), the most important 'M' is the men or human resources. It is the most valuable asset of any organisation.

Manpower planning and human resource planning, though used as synonyms, yet, they are different in purport and meaning. In the past, the phrase manpower planning was widely used; but now the emphasis is on human resource planning which is more broad based. Human resource planning is the process by which a management determines how the current organisation should move from its current manpower position to its desired manpower position.


\(^2\)Megginson, Leon C., Personnel and Human Resources Administration, Richard D. Irwon Co., Illionois, 1977, p 4
Though planning, the management strives to have the right number and the right kind of people at the right place at the right time, to do things which result both the organisation and the individual receiving the maximum long range benefit.

Need for human resource planning

1. In many companies wages and other benefits represent a substantial proportion of turnover. This component of cost therefore must be carefully planned in the context of a corporate plant.

2. Manpower of correct type and quality is a scarce resource. Due to its relative immobility, this may be so, even in conditions of high national unemployment.

3. Legislative as well as moral restraints limit the way in which manpower can be deployed particularly in the short term.

4. Retirement, promotion, recruitment etc., interact in a complex way. If a staff structure is allowed
to develop haphazardly, imbalances may arise which may be difficult to correct.

5. Changes have to be planned far ahead to ensure that necessary skills are unbrokenly available when needed.

6. The comparatively well educated and sophisticated employees of the future will expect the organisation to provide a rational career structure and controlled change.  

Manpower planning in BHEL

The Bharat Heavy Electricals Limited, Trichy has been the most successful public sector unit which is consistently making profits since its inception, increasing its production, diversifying its activities, modernising its technologies and establishing good industrial relations. In short, it is one of the very few public sector undertakings of India which has earned international repute and market.

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BHEL, Trichy is a big organisation with 1500 executives, 3000 supervisors, and more than 10000 workers spread in nearly 92 administrative units. Manpower planning for such a big organisation is always a challenge which the unit has met quite successfully.

Manpower planning cell in BHEL, Trichy

BHEL, Trichy has a manpower planning cell which aims at carrying out manpower planning efficiently and to look after the activities of the various working groups.

The cell is represented by members from personnel department, Industrial engineering department, planning and finance department and training and development department. These departmental representatives constitute permanent members of the group. As and when needed, other members are also co-opted from various other functional departments. The following manpower organisation chart, makes clear the role of manpower planning cell.

From Figure 10, it can be seen that manpower planning cell in BHEL reports to the Head of the personnel department and the cell is assisted by the working group constituted for this purpose.
Organisation Chart of Man power Organisation

Figure 10

Source: Industrial Engineering Department, BHEL, Trichy
The cell develops a comprehensive information system for manpower planning and audit. Working group is constituted in each of the unit to assist the manpower planning cell. The task group will meet at regular intervals, at least once in a month.

The organisational factors that are taken into account by the manpower planning cell for manpower planning are: i) the product mix and ii) the customer mix. The environmental uncertainties that have impact on manpower planning are legal, political and economic and social. The information available to the cell (type and quality) for manpower planning are accurate and reliable. Instruments used in manpower planning are forecasting models, skill inventories and managerial inventory. Job analysis is done for manpower planning for each job and the persons responsible for job analysis are selected from the personnel department, industrial engineering department and training and development departments.

Norms

Norms for estimating manpower requirement - product/section/work centre, service centre-wise etc., and also the overall requirements of manpower in BHEL
are developed on the basis of past experience and scientific studies, keeping in mind the manpower objectives of the units.

Norms generally relate to physical norms, volume norms, positional requirements norms and on.

**Data Bank**

The data bank established by the unit clearly furnishes the relevant information to the Industrial engineering department regularly and adequately. The data bank is also established at the corporate office and manpower cell will interact periodically.

**Plans and Functions of Cell**

The plan for manpower requirement takes into account gross requirements, proposed automation, redeployment, promotion and also induction.

The planning cell initiates special studies to identify people who make poor contribution due to sickness, absenteeism etc. They also conduct information-survey wherever needed on wastages, utilisation and manpower market characteristics.
The cell also makes an assessment of implications of environment change—both technical and government policies—on manpower planning. The manpower cell works in close liaison with industrial engineering department and the planning groups in various departments to carry out manpower audit and manpower budget. Figure 11 illustrates the manpower audit system.

It may be understood from the Figure 11 that manpower audit system is mainly carried out to highlight the strengths and weaknesses of manpower planning, ultimately affecting manpower strength, utilisation and effectiveness. Manpower audit helps to detect the areas of poor utilisation of manpower and to assess the manpower effectiveness and to identify the barriers that block effectiveness. It examines the structure and content of the systems to see if the activities are contributing to the fulfilment of the objectives and identifies the bottlenecks.

Once the barriers for the ineffectiveness is found, the manpower audit guides the organisation to develop a suitable manpower planning model for each manufacturing unit and to make an action plan for
Man power Audit

Man power system:
An audit of various systems in the area of man power to highlight the strength and weakness ultimately affecting man power strength, utilisation and effectiveness.

By recording the components of all the systems relating to man power in the organisation and to see all the important activities have been created by the system.

By examining the structure and content of the systems to see if the activities are contributing to the fulfilment of the objectives.

By examining if the systems are being followed and identifying the bottlenecks.

By analysis of statistics:
- Financial indicators
- Capacity utilisation
- Idle time statistics
- Extra time statistics
- Rejection data
- Cost data
- Absenteeism data
- Backlog/skippage data

Man power utilisation:
To know the status and identification of departments/individuals with poor utilisation.
To identify and quantify reason for poor utilisation.

By special studies:
Industrial Engineering measurement techniques, opinion surveys, interviews, brainstorming

Identify misfits in the organisation, identify barriers to effectiveness

Analysis of performance and potential appraisal data

Diagnosis of organisational environment, organisation norms

Studies in specific behaviour aspects

Man power effectiveness:
Audit to evaluate the status of man power utilisation and to identify the barriers as in the sense of effectiveness.

By examining if the systems are being followed and identifying the bottlenecks.

By analysis of statistics:
- Financial indicators
- Capacity utilisation
- Idle time statistics
- Extra time statistics
- Rejection data
- Cost data
- Absenteeism data
- Backlog/skippage data

By special studies:
Industrial Engineering measurement techniques, opinion surveys, interviews, brainstorming

Identify misfits in the organisation, identify barriers to effectiveness

Analysis of performance and potential appraisal data

Diagnosis of organisational environment, organisation norms

Studies in specific behaviour aspects

Figure 11
Source: Industrial Engineering Department, BHEL, Trichy
implementation and review. The efficiency of manpower planning lies in building up a good manpower planning system. Figure 12 shows how the manpower planning system functions.

Manpower Planning System

Norms are developed in BHEL for forecasting the manpower demand having the long range corporate objective and divisional objective in mind. Taking into account the existing manpower inventory, the manpower supply forecast and the manpower wastage forecast and net manpower supply forecast are made to help the organisation to arrive at the net manpower requirement for the period of forecast.

Manpower forecasting in BHEL

BHEL forecasts the demand and supply of manpower and reconciles it.

Manpower demand forecast

BHEL estimates the future manpower demand (in quantitative and qualitative terms) and necessary steps are taken to ensure the availability of appropriate manpower at the appropriate time. These projections will be quite essential for planning, maintaining,
Man power Planning System

Long range objective Plan (Corporate Plan)

Divisional objective and Plan

Man power demand forecast- No category Specialisation

Norms

Man power inventory
Number
Category
Specialisation
Age
Appraisal data etc

Man power and supply forecast
Number
Category
Specialisation
Appraisal data etc

Man power wastage forecast

Matching process

Net man power supply forecast

Net man power requirement forecast

Action plan
Budgeting and control
Utilisation and Audit
Acquisition
Redeployment
Reporting development

Implementation and Review

Source: Industrial Engineering Department, BHEL, Trichy
training, re-training, redeployment and recruitment well in advance.

Manpower supply forecast

It involves,

1. Analysis of existing manpower,
2. Determination and forecasting of the wastage in future,
3. Determination and forecasting the potential changes in manpower because of promotion, transfer, etc.
4. Analysis and forecasting the effect of changing conditions of work,
5. Determination of the net supply of manpower from within the organisation.

Reconciling Demand and Supply

By matching the information on demand and supply, resource imbalances are predicted. Surplus manpower and deficit manpower position are noted and steps taken accordingly.

Net manpower demand forecast

It is prepared to forecast a resource gap - year wise and it is very essential to identify skill
gaps in case of each category, particularly for the products and technology.

**Fresh inductions**

BHEL resorts to fresh inductions in the work force to

a) meet the needs due to increase in the turnover capacity of the existing products,

b) meet the needs of new products/operational services,

c) inject new blood in the organisation.

Figure 13 explains the manpower planning process carried out in BHEL.

**Manpower Planning Process in BHEL**

The process aims at achieving the corporate objectives in terms of turnover, value added, product mix, market share, etc., for the next 5-10 years. Broad objectives for each division of BHEL are laid down. A thorough analysis of manpower resources is done with the help of manpower demand. The manpower demand takes into account the internal manpower supply and the external manpower supply. With the help of budget, utilisation and supply aspects of manpower, training facilities
Man Power Planning Process

- Company Objectives
- Man Power Demand
- Reconcile
- Analysis of Man Power Resources
- Internal Man Power Supply
- External Man Power Supply

- Personnel
  - Policies
  - Remuneration
  - Conditions of Service
  - Management
  - Employee Relations

- Supply
  - Recruitment
  - Promotion
  - Training
  - Development
  - Redundancies

- Training
  - Initial
  - Conduction
  - Consumer

- Utilisation
  - Productivity Improvements
  - Man Power Requirements

Source: Industrial Engineering Department, BHEL, Trichy
available, personnel policies, etc., the reconciliation is done for predicting the net manpower required. Thus the manpower planning process is done.

Developing and implementing a mechanism for continuous monitoring and review for the utilisation and effectiveness of manpower are as important as the active manpower planning and forecasting. The clarity of objectives, existing work methods, tools and facilities, working conditions and motivation are the main determinants of utilisation and effectiveness. It has been observed by Industrial Engineers in BHEL that the actual work content of job is much more than the ideal work content due to number of reasons such as design defects, ineffective methods of working, obsolete tools and facilities, shortcomings in the managerial efforts, poor attitude of work men, etc.
Man power Planning Model

Corporate Policies, Objectives and Plans

Forecasting Total Man power requirements

Present Inventory of man power

Total man power Requirements

Programme to acquire man power

Long run

Programme to acquire additional man power

Programme to reduce man power

Programme to make Adjustments

Figure 14

Source: Industrial Engineering Department, BHEL, Trichy
Figure 14 shows the manpower planning model in vogue for each unit. Manpower planning model makes a description as to how the programme to acquire manpower is to be done. Keeping in mind the corporate policies, objectives and plans, the manpower planning cell should forecast the total manpower requirements by taking into account the present inventory of manpower. The model makes it clear that the programmes to acquire additional manpower, to reduce manpower and to make adjustments may be done in the short run or in the long run to develop the required manpower.

Besides these manpower planning models, the manpower planning system helps the manpower audit to accurately forecast the manpower requirement.

Manpower Planning Objectives

Manpower planning objectives in BHEL are decided on the basis of nature and the period of planning.

Short term manpower planning

Short term manpower planning, as the name suggests is made for a short period, i.e., for a period of not more than one year. Since BHEL is a very big organisation, manpower assessment is made to meet its
future demand ans also its current production target. Thus the short term manpower planning helps the organisation to achieve its short period objectives.

Medium term manpower planning

Medium term manpower planning is made for a period of two years. The objectives during this period are recruitment and creation of manpower data base. The cause for recruitment takes place due to resignation, death, retirement and promotion. This is also called as manpower wastages. In order to fulfil these objectives medium term manpower planning is followed.

Long term manpower planning

Long term manpower planning is made for more than five years. The objectives that are aimed by BHEL in the long term manpower planning are to achieve corporate goals, physical output, and organisational expansion or development. In order to fulfil these objectives, research and development programmes are also systematically carried out.
Manpower planning method

To ensure effective manpower planning, the cell makes use of three types of methods. They are: i) Physical norms method, ii) Standard hours method and iii) Estimation method.

Physical norms method

This is a method fully depending upon the work load basis. The annual work load is determined by the commercial department. The quantum of output to be produced in a year is determined in advance, in line with the budget. Then, the quantum which can be produced per shift is derived. The annual shifts needed for producing the required quantum of production are thus decided before hand. It is found that the maximum annual shifts available per individual worker for all of the operation is 250 shifts on an average in a year.

Standard hours method

In this method standard hours for each and every task is fixed by scientific study and experience. The work load for the year to achieve the required production is fixed by practice. The work content for the year for a particular department is determined. Multiplying the total work load in terms of tasks for
the year and the standard hours for all the tasks, the total standard hours needed for the operation in the year is decided. For example, annual shifts available per individual worker is 250 shifts.

\[
\text{Total hours available per shift} = 8 \text{ h} \\
\text{Total standard hours} = 8 \text{ h} \times 200 = 2000 \text{ h}
\]

The total standard hours needed for the whole operation for one year is divided by the available hours (2000 h) and the number of staff needed for operations for the year is calculated.

**Estimation method**

The researcher also observed that in some cases manpower requirements of BHEL, Trichy are also made simply by rough estimation based on past experience.

Certain positions are determined as a proportion to certain jobs. For example, for every 10 direct worker, there may be one supervisor and for every supervisor there may be one unskilled worker. For every 400 workers, both direct and indirect, one time office man may be required.
Manpower position at BHEL

Once the targets and objectives have been set for a fixed time span, the next step is to have a total audit of the existing manpower in the organisation.

The workforce at BHEL consists of various categories of employees with different levels of skills, viz.

a. Executive - Consisting of Engineers, Personnel Executives, Doctors, Accounts Executives, etc.

b. Supervisors - Technical and non-technical in production, Planning, Materials Management, Commercial, Engineering, Finance Departments, etc.

c. Artisans - Fitters, Welders, Turners, Machinists, Painters, Crane Operators, Riggers, Drivers, etc.

d. Supporting technical staff - Draughtsman, Scientific assistants, Lab. assistants, etc.

e. Unskilled worker - Persons used for material movements, Cleaning, Office attendants, etc.
The following Tables and Figures clearly depict the categoriwise manpower strength, categorywise skill inventory and Agewise analysis for the past 5 years ie., from 1984-85 to 1988-89.

Table 4.1 Categorywise manpower strength

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Executives</td>
<td>1354</td>
<td>1391</td>
<td>1432</td>
<td>1463</td>
<td>1480</td>
</tr>
<tr>
<td>Supervisors</td>
<td>2819</td>
<td>2897</td>
<td>2980</td>
<td>3067</td>
<td>3081</td>
</tr>
<tr>
<td>Artisans</td>
<td>5340</td>
<td>5486</td>
<td>5647</td>
<td>5847</td>
<td>5900</td>
</tr>
<tr>
<td>Supporting Technical staff</td>
<td>1662</td>
<td>1592</td>
<td>1211</td>
<td>842</td>
<td>759</td>
</tr>
<tr>
<td>Clerical Office &amp; Supporting staff</td>
<td>1159</td>
<td>1127</td>
<td>1161</td>
<td>1170</td>
<td>1150</td>
</tr>
<tr>
<td>Semi-skilled workers</td>
<td>2052</td>
<td>2109</td>
<td>2171</td>
<td>2249</td>
<td>2261</td>
</tr>
<tr>
<td>Unskilled workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source: Industrial Engineering Department.</td>
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</tbody>
</table>

From the Table 4.1 and Figure 15, we see more or less a stability in the manpower strength over the years.
Man power strength

Man power strength (Thousands)

1984-85 85-86 86-87 87-88 88-89

Figure 15
Table 4.2 Table showing categorywise Skill inventory

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Fitter</td>
<td>2350</td>
<td>2411</td>
<td>2485</td>
<td>2505</td>
<td>2525</td>
</tr>
<tr>
<td>Welder</td>
<td>833</td>
<td>856</td>
<td>881</td>
<td>911</td>
<td>931</td>
</tr>
<tr>
<td>Rigger</td>
<td>299</td>
<td>307</td>
<td>316</td>
<td>336</td>
<td>340</td>
</tr>
<tr>
<td>Turner</td>
<td>475</td>
<td>488</td>
<td>502</td>
<td>532</td>
<td>535</td>
</tr>
<tr>
<td>Machinist</td>
<td>336</td>
<td>346</td>
<td>356</td>
<td>376</td>
<td>380</td>
</tr>
<tr>
<td>Electrician</td>
<td>198</td>
<td>203</td>
<td>209</td>
<td>239</td>
<td>240</td>
</tr>
<tr>
<td>Crane operator</td>
<td>219</td>
<td>229</td>
<td>231</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Others</td>
<td>630</td>
<td>647</td>
<td>667</td>
<td>708</td>
<td>709</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5340</strong></td>
<td><strong>5487</strong></td>
<td><strong>5647</strong></td>
<td><strong>5847</strong></td>
<td><strong>5900</strong></td>
</tr>
</tbody>
</table>

Source: Industrial Engineering Department

The Table 4.2 and Figure 16 give a clear picture of categorywise skill inventory. There is not much increase in the categorywise skill inventory; even if it is there, the increase is only marginal. Only in case of fitter, the number of categorywise skill inventory is high. On the whole, categorywise skill inventory shows slightly increasing trend each year.
Category-wise skill inventory

Number of employees

Year

Fitter
Welder
Rigger
Turner
Machi.
Elect.
Cr.opr
Others

Figure 16
Table 4.3 Age-wise analysis of the workforce as on 31st March 1989

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 25</td>
<td>379</td>
</tr>
<tr>
<td>25 - 30</td>
<td>2259</td>
</tr>
<tr>
<td>30 - 35</td>
<td>3325</td>
</tr>
<tr>
<td>35 - 40</td>
<td>2543</td>
</tr>
<tr>
<td>40 - 45</td>
<td>2484</td>
</tr>
<tr>
<td>45 - 50</td>
<td>1337</td>
</tr>
<tr>
<td>50 - 55</td>
<td>623</td>
</tr>
<tr>
<td>55 - 60</td>
<td>152</td>
</tr>
</tbody>
</table>

Total: 13102

Source: Industrial Engineering Department
Age-wise analysis of work force

Figure 17
From the Table 4.3 and Figure 17 and Graph shown it can be seen that about 8506 employees are in the age group 20-40 and 4596 employees in 41-58 range. It may be noted that around 775 employees will get retired from the services of BHEL, Trichy on superannuation in the next 8 years. Efforts may have to be taken by the concerned authorities through the process of manpower planning to fill up the vacancies that are going to arise.

Besides these, there may be some unexpected wastage of manpower strength through resignations, deaths, voluntary retirement etc., and appropriate action may have to be initiated, through the process of manpower planning to fill up the vacancies, that are likely to arise, with suitable persons.

It is thus obvious that the labour productivity which can be achieved in an organisation depends to a greater extent on the labour input and to a lesser extent on the technology adopted. It may be possible for a large organisation like BHEL to switch over to a sophisticated technology within a short notice. But it is certainly impossible to change the work-force
to adapt the change in technology overnight. It is due to obvious reasons like general resistance among the workforce for any change in their method of working, lack of adequate knowledge in the concerned technology etc.

However, an organisation can plan for any updating of technology/manufacturing process in a phased manner giving adequate lead time to train the existing employees for meeting the proposed change. Another way of overcoming the challenge of change is to recruit new people of required calibre, quality and skill. In both the cases, the concept of manpower planning has got a great emphasis. Through the process of adequate and timely manpower planning an organisation can be assured of the availability of right people at the right time in right quantity. Given this condition of availability of skilled workforce (through judicial manpower planning) and the technology, an organisation can easily look for increased labour productivity.