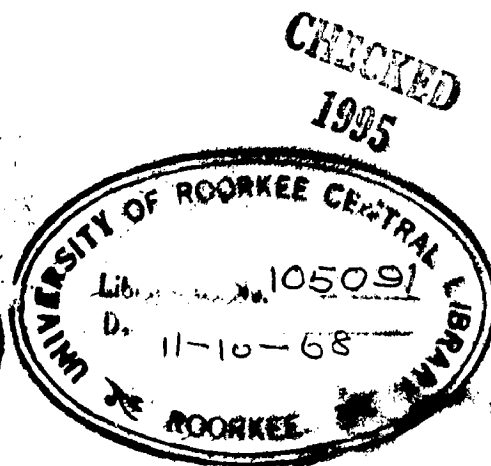


JOB EVALUATION AND MERIT RATING PLANS IN HEAVY ENGINEERING INDUSTRIES

A Dissertation
submitted in partial fulfilment
of the requirements for the Degree
of
MASTER OF ENGINEERING
in
PRODUCTION ENGINEERING

By
SUDESH KUMAR



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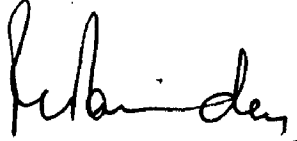
DEPARTMENT OF MECHANICAL ENGINEERING
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July 20, 1968

C E R T I F I C A T E

Certified that the thesis entitled "JOB EVALUATION AND MERIT RATING PLANS IN HEAVY ENGINEERING INDUSTRIES" which is being submitted by Mr. Sudesh Kumar, in partial fulfilment for the award of degree of Master of Engineering (Production) of University of Roorkee, Roorkee is a record of student's own work carried out by him under my supervision and guidance. The results embodied in this thesis have not been submitted for award of any other Degree or Diploma.

This is further to certify that he has worked for a period of about seven months, from 15th December 1967 to 15th July' 1968 for preparing the thesis for Master of Engineering at this University.

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CHAPTER I

INTRODUCTION

Job evaluation is an effort to apply sound principles of measurement to determine what each job in an organization is really worth. It is not what the management thinks it ought to pay, nor what the worker, or his union, thinks he ought to get, but it is a fair share, to which a person is entitled after his satisfactory performance. For accurate job evaluation it is not only necessary to take into account the "amount of work" because this implies only the quantitative part of the employer's contribution. This part is tangible and can be positively checked by comparing the worker's output in unit time with set standards as is usually done for incentive payment. Less tangible, and hence more difficult, is the qualitative part which involves skill, effort, responsibility, and working conditions, not to mention many possible subordinate considerations that would also fall under these four major items.

Labour efficiency or man-productivity is a variable quantity and it depends upon the plant conditions and the prevailing management policies being pursued. The latter is a variable and can be largely controlled, by the policies, plans, and activities of the management which create the jobs, or more accurately the man-job

units.

The cause of the increased interest in job evaluation during recent years has been thoroughly discussed under "The functions of the job evaluation"; under modern conditions of production it has been found desirable to fix relative wages on the basis of some comparison of job contents. The main reason for this has been that wage earners, like most other people, have strong feeling about the "fairness" or "equity" of relative wages, this being judged normally on the basis of comparative job contents. A widespread opinion on this matter is that people doing the same job with equal efficiency should be paid the same wages. Differences in job contents, in the way of either job requirements or job deterrents, should be reflected in unequal pay for jobs concerned. Some authors have combined these two rules into the proposition that income differentials would be "just" only if the persons holding different positions do not wish to exchange these positions. Furthermore, there is a good deal of agreement as to the sort of job characteristics that matter from this point of view the things that make a job decidedly unpleasant as well as the particular job qualifications that "ought to" be specially rewarded. This broad measure of agreement provides through systematic analysis of job contents a sound basis for fixing wage differences acceptable to the workers. In several cases the application of job evaluation technique for this purpose

was stimulated by the war and post-war abnormalities of employment, accompanied in some cases by wage freeze or repeated wage adjustments owing to the changes in the cost of living (which distorted the wage structure). This was further impeded by frequent labour shortages especially for semiskilled and skilled jobs. Thus wage control by the National War Labour Board was a strong stimulant to the increased application of job Evaluation in the United States. Manifest anomalies and inequities in the wage structure were often admitted as a ground for approving wage increases, job evaluation could be used to demonstrate the existence of such anomalies. Similarly in the post-war period of wage control in the Netherlands, ~~job evaluation was accepted and encouraged by the~~ authorities as a means of making appropriate wage adjustments for particular jobs or industries without upsetting the general objective of maintaining substantial stability in the national wage level as a whole. In Germany, too, job Evaluation received wider applications in the course of the second world war and during the first few post-war years, when wage control continued to be applied.

A structure of wage differentials which broadly satisfies worker has obvious advantages to workers and employers over a structure that does not do so. It reduces grievances and disputes and generally makes people feel happier. To the extent that job Evaluation can help in establishing such a wage structure, the method should

therefor be welcomed. The reason why in many cases it is not enthusiastically greeted or is even emphatically rejected may be ignorance concerning its true nature. Although in some instances it has been found that the disadvantages which job evaluation might involve in any particular case outweighed its advantages.

Where management has taken the initiative of introducing job evaluation, the technique has naturally become a matter of great interest to the trade unions. In some cases the latter have been highly distrustful owing to a variety of reasons that will be considered later. Many employers are, however, also sceptical or ~~critical of job evaluation~~, sometimes they prefer to set wages by simple rule of thumb methods or they find job evaluation too costly and time consuming. They believe that it does not result in a wage structure differing substantially from one that could be obtained through less sophisticated methods. The fact that both employers and trade union leaders are divided amongst themselves as to the value of the method therefore the subject of job evaluation has become a topic of the considerable interest.

Merit rating is a systematic, periodic, and so far as may be humanly possible, an impartial rating of an employee's excellence in matters pertaining to his present job and his potentialities for a better job.

Naturally, this must be compared with the excellence of other individuals on the similar jobs. Like job evaluation, this can be done directly or indirectly. The direct approach of ranking the workers is more often used in this case than for job evaluation purposes. The indirect approach, appraising against predetermined standards is unsatisfactory for some of the most important qualities.

We cannot claim that man-rating is as objective as job rating. In fact, it is conceded that embarrassing situations may occasionally arise. No doubt, fair minded raters, when trained, can attain a high degree of impartiality, and fairminded employees can take their ratings without irritation. This does not just happen, it requires a lot of confidence in connection with evaluation.

Obviously, there is an opportunity here for management to make or mar personnel relations. So far as it can establish facts or the basis for decisions and adhere to them with unquestionable fairness it will promote justice and consequent harmony. This would encourage the employees to make some praiseworthy achievements, and feel gratified. It is where merit rating must put the emphasis. If it succeeds in that it can also point out the soft spots and solicit discipline toward the desired development.

The formal kind of merit rating seems to have

stemmed from the school; it was applied to U.S. teachers themselves in 1916. In 1916 the Bureau of salesmanship was organized, partly to improve the rating of salesmen, and consequently a rating scale was adopted by them in 1917. During the same years U.S. Army had developed the Scott man-to-man comparison scale for rating of the graduates of officer training courses and also for the selection of suitable candidates for the training. It further extended its merit ratings to all commissioned officers in 1919. In all the above cases the rater selected records of five men, each to represent the same quality, another set of five men for the next quality etc. These ratings were used as a "man-to-man scale". In 1919-20 forty-five companies and its associates started man rating experiments in industry. This led to the rating of men on one quality at a time.

In a small company individual recognition is simple. An occasional pat on the back of worker by foreman can keep the worker informed as to how he stands. But in a company large enough to have a job evaluation programme it is inevitable that some supervisors will be harsh and some lenient, and no two will judge workers by the same set of characteristics. Also the workers and supervisors may be shifted around so that the supervisor who knows a man best may not be there when a question of pay raise, promotion or layoff arises. In a large company, therefore

on the road to self improvement.

(4) Merit rating assists management to discover men of special talent or capacities for greater responsibilities.

(5) Merit rating forms can act as a guide to the employees enabling them to achieve high standards.

(6) Merit rating is an excellent recruiting device by which suitable worker is attracted to the company where he knows he will not be side tracked, where his good work will not go unnoticed, and where he will work under intelligent and understanding supervision.

(7) Merit rating can become an effective means of individual employee analysis which stimulates and develops not only the employees rated but the supervisors who rate them.

(8) Confidence is inspired among customers and the public in general when it is known that company interest in its employee is expressed by carefully developed methods such as merit rating.

CHAPTER II

STATEMENT OF PROBLEM:

The methods of Job Evaluation and Merits Ratings which have been developed for the personnel management and making a satisfactory wage structure are well known. These methods have been used extensively for the improvement in wage structure and selection of useful personnels in foreign countries since a long. These methods are not very common in Indian Industries because very little work has been done in our country on these methods. The plans which have been developed in U.S.A. or U.K. will be of very little use for our industries, the aim of this piece of work is to formulate these plans to suit existing conditions, not leaving to mention the factors which must be considered to formulate new plans.

The plans developed here especially for Bharat Heavy Electricals Ltd., Ranipur, Hardwar, are based on the assumption that the conditions do not vary appreciably in other units of this concern or in any other public sector undertakings. These plans can be applied as such or with a little modifications to other types of industries. It is obvious that such an application is not going to give accurate results in view of the fact that the conditions may go on changing from time to time and from place to place, and a more detailed study is required for accurate results. This problem as stated in the following lines are

discussed in detail in this thesis and the Job Evaluation plan has been applied to the said concern actually, the Merit-Ratings plan requires a longer span of time to show its effects hence could not be applied.

The problem investigated in this thesis can be stated briefly as follows.

" To formulate a job evaluation plan which suits Indian conditions and can be applied to a large heavy engineering establishment covering different trades. And to analyse the applicability of few well known Merit Rating plans and then designing a plan which can be applied to above said organization".

CHAPTER III

AVAILABLE METHODS

" It is necessary that the plan of job evaluation be so simple and so readily understood that an employee, after being given proper instructions, can evaluate his own job".

- D.W. Need.

Basically there are four accepted systems for evaluating the relative worth of jobs. These are:

1. Ranking Method.
2. Labour-Classification or Grading Method
3. Factor comparison Method
4. The point method

The techniques usually employed for measuring the characteristics of a job are:

1. Direct comparison of characteristics.
2. Indirect comparison of characteristics against

Predetermined Degree definitions, with point allotments.

Selection of Rating plan:

Three agencies are responsible for choosing the particular rating plan for organization. These are:

1. The director of job evaluation programme.
2. The director and his advisory committee.
3. The over all committee in charge of the installation

When the director selects the plan, the choice can usually be made more quickly since he can weigh each of the four systems against the needs of the organization. And he can take a decision without the delay of committee discussion. He knows and understand the rating method and is not impeded by having to explain the techniques and problems of each system to other individuals. In many instances, more than one of the four systems could be utilized almost equally well. Then, it becomes essential that the rating plan should be selected such that, it would be acceptable to others in the company, when the director and his advisory committee choose the plan, the result may be more pleasing. Consideration can be given to each of the four methods, and the final choice made by a majority Vote. Since the group represents various employee levels, different points of view can be brought into the decision and usually a better selection can be made. But here the choice cannot be made as rapidly as in the first method. The important advantage of participation is gained. For these reasons, the second plan of selection usually is preferable to the first.

Although each organization must prepare its own criteria for selection of rating plan, the following lists suggests some of the points which should be included.

1. The system should provide for a thorough study of all jobs to be evaluated.
2. The system should be one which supervisors and

employees can understand and are willing to accept.

3. The system adopted should be one which will produce as high a degree of accuracy as possible in determining the relative worth of jobs.

4. The system should be relatively easy to install and maintain.

5. The system should fit the specific needs of the organization.

6. Range of jobs to be rated.

7. The type of jobs within the range.

8. The number of jobs to be studied.

9. The length of time required for the study.

10. And the cost of installation and maintenance of the plan.

Basic systems for Rating the jobs:

(1) The Ranking method:

Under this method of rating, Jobs are ranked from lowest to highest in terms of their differences in levels of duties., responsibilities, and requirements. The jobs are not broken down into their component parts but are considered as a whole, and the jobs are compared against each other in order to determine their relative rank or position. Thus, the job performed at the simplest, most routine level would fall at the lowest position in rank order. The remaining jobs would be graduated upward as

their duties, responsibilities, and requirements increase in complexity.

The advantages of Ranking method are:

1. It is relatively simple to use.
2. Ranking could be done rapidly.
3. It is relatively inexpensive to install.

The disadvantages of Ranking method are:

1. No definite or concrete standards exist for determining the ranks.
2. The ranking may be superficial, since no detailed consideration is given to the factors connected to the jobs.
3. Confusion is likely to result from similar job titles.
4. It is difficult to find enough raters with sufficient knowledge of all jobs.
5. The system becomes difficult to use as the number of jobs increases and as the jobs become more complex.
6. Determination of the rank or position is likely to be influenced by the existing wage or salary.
7. Raters may be ranking incumbents on the jobs and not the jobs themselves.

(2) The Classification or grading method:

This system provides the rater with a scale or "yardstick" to use in measuring differences among jobs.

The scale consists of a series of grades or classes which have been defined in terms of the range of jobs to be rated. The grade definitions are written in such a manner that they define differences in levels of duties responsibilities, and requirements. This system does not analyse jobs in terms of their component parts, the jobs are considered as a whole without having separate values placed on each part.

The following are the advantages of this method.

1. The method is very simple to use.
2. It is easily understood.
3. It is relatively easy to execute and
4. The results achieved are fairly satisfactory.

Moreover the method suffers from the following:

Defects:

1. Since no detailed analysis is made, blanket judgment of the whole job may produce incorrect classification.
2. No rating sheets are used to indicate the exact values used by the raters to determine the position of job.
3. The jobs may belong partly to one class and partly to another, under this system no provision for such cases exists.
4. The existing salary or wage range may effect the placement of a job into its class.
5. A single rater is not likely to be familiar with all the jobs.
6. The system becomes more difficult to use as the

number of jobs increases and as the jobs become more complex.

7. The grade or class descriptions are relatively difficult to write.

(3) The factor comparison method:

This method of evaluating job is one under which the jobs are analysed by certain factors, usually five in number. Key jobs are chosen to represent each major level of duties, responsibilities and skill thus covering the entire range of jobs. These jobs are then compared with each other, factor-by-factor, ranking the jobs with respect to each factor in the order of their relative importance. For example, if two of the factors were mental requirements and skill, the rater would first rank the key jobs from low to high under mental requirements. Then he would rank the same key jobs from low to high under skill. This method would be followed for each of the factors used in the rating plan. The raters then enter under each factor of each job the proportion of the total current rate being paid for the job which they believe should be assigned to the particular factor. The values assigned for each factor of the job are added together to determine its total value. At this point, the jobs are arranged in ascending order according to the total value determined by the process.

The advantages claimed for this method are:

1. The job-to-job comparison assures that jobs are

compared on comparable points.

2. A scale is constructed for each installation, thereby assuring a plan that is tailor made for the organization.

3. Once the scale is ready it can be easily used for rating other jobs.

4. The scale is expressed in monetary units and requires no conversion.

Apart from the above advantages the system have following disadvantages.

1. If rate inequities exist in key jobs used for determining the scale, they will continue to exist, as the scale is set upon monetary basis.

2. Since the same raters does not rate all the jobs the basis for the entire rating scale may be thrown out of balance due to personal fluctuations.

3. A change in the duties of a key job used to establish the rating scale for other jobs may throw the scale out of use.

4. The construction of the scale is complicated.

5. The scheme is difficult to explain to employees.

6. The method is time consuming.

7. Considerable clerical detail is required.

(4) The Point Method:

In about 1925 Merrill R. Lott designed the point system for job evaluation. This method became popular

almost immediately and since then has been the most widely used of the four basis systems in the United States.

The grade or classification method, was developed a few years prior to the point plan and was first to introduce a concrete scale for measuring the job worth, but it failed to provide a system which would permit analytical study. The reason being that the grade scale measures jobs in their entirety instead of the individual parts of the job. It was then felt that if some method could be devised which would break the jobs into their component parts and permit a comparison of the parts, a far more thorough analysis would result. This is the basis of point system of Job Evaluation. In this method the job to be rated is measured, factor by factor, against a scale which has been set up before hand. The degree in the scale which most nearly describes the situation with regard to that factor in that particular job is selected.

Some of the advantages of this method are:

1. A graphic and descriptive type of scale is used which is considered by many authorities to be more reliable and valid than any other device (Fig.No.3 to 9).
- 2, The degree definitions are relatively easy to use, as they are written in terms which are applicable to the work being rated (Refer to page).

3. The point value of the jobs show the relative difference between the jobs in numerical terms. (Fig.No.2)

4. This system enables easy placing of the jobs into different classes.

5. The system is not easy to manipulate as compared to other systems.

6. The accuracy and consistency of the plan improves with use.

7. The plan can be understood easily by the employees and the supervisors.

However certain disadvantages are also to be found in this method.

1. High skill is required in selecting correct factors and degrees and in writing clear and understandable definitions of the factors and degrees.

2. Allocating the proper numerical weights to the factors and assigning points to the degrees is relatively difficult.

3. The assignment of point values is done more or less arbitrarily.

4. Installation of the system is time-consuming.

5. Considerable clerical detail is required.

Comparison of four basic Methods:

(1) The systems may first be compared on the basis of whether they provide quantitative or non-quantitative

approach to the rating problem. The quantitative approach means that jobs are broken down into component parts and that each part is analysed and given a value either in terms of points or money, the final value of the jobs being the sum of the points or money assigned to individual parts. The nonquantitative approach means that the jobs are not divided into their component parts with each part having a separate value, but instead, are treated as a whole. The systems using quantitative approach are considered to be more analytical in nature. Both the point and factor-comparison methods fall under the category of quantitative techniques, the ranking, grading or classification methods come under the nonquantitative techniques.

(2) Another basis of comparison is whether the system provides a scale against which the jobs could be measured or alternatively the jobs could be compared against each other.

The point and the grade or classification method provide a scale against which jobs are measured. The factor-comparison and ranking methods require that jobs be compared to each other and not to a predetermined scale. However, these two methods differ in the way the comparison is made since the former compares the job element to job element and the latter compares the whole job to whole job.

(3) The third basis of comparison considers the question whether or not one particular rating method measures a broad range of jobs better than others. Since the ranking and grade or classification method considers the whole job rather than its components, complications in rating usually arise when the range of the job is broad. Both systems require the raters to know all the jobs thoroughly in order to avoid overlooking important points which effect the accuracy of the rating. Because the point and factor comparison methods analyze job elements rather than consider the job as a whole, in their use there is less danger of overlooking important characteristics.

(4) The four rating plans next be compared on the basis of whether or not one or more of them may provide a better method of evaluating the jobs that vary in complexity and homogeneity. When the group of jobs to be compared is composed of relatively simple levels of duties, responsibilities and requirements, a less analytical approach is quite satisfactory. Such jobs are not too difficult for the average rater to know and understand. Therefore, he can rate them with a fairly high degree of accuracy even though he does not break them into their component elements. On the other hand as the jobs increase in complexity, important differences may be missed unless one of the quantitative methods is used.

When a series of jobs include quite similar duties, responsibilities and requirements, comparison is often easy because the rater is comparing similar items. When jobs vary widely in the type of functions performed, unlike elements have to be compared, and an analytical method provides the rater with a better technique for making his evaluation. Hence the Ranking or classification system might be well chosen to measure the homogeneous group, while the point or factor-comparison system might be a better means of comparing dis-similar jobs.

(5) Another basis for comparison of the systems may be to recognize the fact that the rating methods differ in the degree to which they provide a satisfactory plan judged in terms of the number of jobs to be rated. Where the number of jobs is relatively small, the ranking or classification method can produce accurate evaluation. This is true because the number of jobs the rater has to keep in mind is limited and the comparison of jobs as a whole is not difficult. As the number of jobs increases, some analytical method is required. In the latter situation, the point or factor comparison method will be suitable.

(6) Finally, the systems may be compared in terms of time and cost and also the simplicity and ease of understanding. Ranking or classification methods require less time and money to install and maintain than do the point

and Factor-comparison plans. However, accuracy is the primary consideration and a high degree should be achieved, cost should not be a consideration. Small organizations having narrow range, with relatively simple and homogeneous group and a limited number of jobs, may utilize one of the less costly methods without sacrificing accuracy, but many large companies cannot.

CHAPTER IV

Formulation of Job Evaluation Plan

1. Construction of the point series:

Who will construct the scale:

Companies vary among the choices of one person, one person aided by a committee and an over-all committee. Final acceptance of the scale as an accurate and defensible method for determining the relative positions of the jobs to be rated, is essential. Several basic, and in some instances, fairly complicated steps must be executed in building a point scale. Although one individual may have the technical knowledge necessary, it is usually doubtful, that he will also have the wide information about the company and its operations, which are so essential to the construction of a good rating scale.

Therefore, it is essential that the maker of the scale must have the technical as well as company knowledge.

The three factors listed below decide the construction of scales.

- (1) The type of jobs to be evaluated.
- (2) The Range of the jobs to be evaluated and
- (3) The number of different scales needed to cover the types and ranges of job selected.

Those responsible must decide whether the job evaluation plan shall include factory, clerical, sales,

and executive positions or whether the plan shall be limited to fewer types. In addition, the range of jobs to be rated must be determined for each type selected. The point scale must be designed to fit the jobs it is to measure. One scale will not usually measure more than one basic type, although it will serve to measure a range of jobs.

Basic steps required in the construction of a point scale are:

- (1) To select and define the factors needed to measure a particular range of jobs.
- (2) To determine and define the degrees for each factor.
- (3) To determine the relative values to be assigned to each factor.
- (4) Assign point values to each degree of each factor.
- (5) Design a job-evaluation manual.

4.2 Factor:

The term "factor" has a particular meaning for job evaluation purposes. Webster⁶ defines a factor as an "element or constituent serving to form, compose, or make up a compound, a component part of a whole".

A clear distinction between the job and the incumbent on the job must be made, since it is not the purpose of job evaluation to rate the man (this is

covered under merit rating). Therefore, factors or characteristics are component parts of elements or distinguishing properties. These must be selected for the purpose of measuring the job and limited solely to that purpose, a requirement which necessitates omitting of any factor, which would measure the man on the job. The measurement of men, merit rating, is a separate and different process from the measurement of jobs. If this distinction is not observed in every phase of the evaluation procedure which begins with the selection of job factors the results will be inaccurate and inequitable, because the man on the job will be rated, not the job itself.

After the rater has given the term factor a uniform interpretation, he is in a position to know what he has to select. The organizer of the programme might well prepare lists of factors used by other organizations in rating the jobs. Such a list is included here for guidance.

Example of job factors

1. Skill
2. Efforts
3. Initiative
4. Complexity
5. Judgment
6. Analytical ability
7. Creative ability

8. Manual dexterity
9. Experience
10. Working conditions
11. Mental requirements
12. Aptitude for learning
13. Knowledge of merchandise
14. Planning procedures
15. Responsibility for work of others
16. Responsibility for policy formulation
17. Responsibility for personnel
18. Responsibility for funds or property
19. Ingenuity
20. Mental effort
21. Physical effort
22. Adaptability
23. Supervision exercised
24. Supervision received
25. Accuracy
26. Personal contacts
27. Public relations
28. Machine operations
29. Education
30. Monotony of work
31. Versatility
32. Confidential information

4.3 Number of factors to be used

In the earlier point plans a relatively large

number of factors was used. Lott's⁸ original plan proposed fifteen factors, as the system was developed and refined, a trend towards the use of fewer factors became apparent E.G. Bonge⁹, who developed the factor comparison method, which also requires factors, advocated using only five factors in most installations of that method. Viteles¹⁰, a leading psychologist, recommends somewhere between five and ten factors for most scales, the emphasis being placed on the lower number. If too few factors are included in the scale, adequate differentiation among the jobs may be impossible. The omission of important job elements could affect the accuracy and validity of the evaluation itself. On the other hand, if too many factors are included, the rater is called upon to make finer distinctions in his rating, than are practicable.

After analysing the problem of the number of factors very thoroughly, Lytle² concludes, that there are really only four major job characteristics namely:-

1. Skill:

That, which must be already possessed by the worker, and additions which must be acquired.

2. Effort:

That which the worker must be able to exert in use of both physique and skill.

3. Responsibility:

That which the worker must be able to assume.

4. Working conditions:

What the worker must hazared and endure.

A study of the factors listed above reveals, that they could be grouped into Lytles² four major types, a fact which would be true of almost any comparable list of factors which might be compiled. However such a classification results in so broad a coverage for each of these major factors, that adequate differentiation among the jobs may not be possible. In order to solve this dilemma, these major factors are subdivided into minor factors. This is accomplished by analyzing the types of skill, effort, responsibility and working conditions, which exist in the range of the jobs for which the scale is being constructed. For example, education, training, experience of skill; effort might be divided into mental, physical, and visual demands etc. Companies vary in the number of factors they use in their scales. Some limits the number to as few as three, while others apparently do not really it at all, since they include twenty five or more. The most popular range is from five to fifteen, and the American avorago is approximately ten. French average is twelve and H.S.L. plant at Rourkela is also using 12 factors. B.H.E.L., Hardwar is so far using 15 factors. In the proposed plan there are ^{four} five major and 19 minor factors. These are listed below (Fig.No.1).

1. Skill

Education

Experience

Analytical ability

Mental Skill

Manual Skill

Training

2. Responsibility for

Material or equipment

Tools or equipment

Work of others

Safety of others

Supervision

Independence

3. Efforts

Physical

Mental

4. Working conditions

Hazards to self

Atmosphere

Temperature

Contact or using

Glare or Dark

4.4 Definition of Factors:

The next step is to define the factors, which have been selected. A concrete definition of each factor is essential, if a uniform consistent interpretation of factor meaning is to be secured. Unless, each rater uses each factor to measure exactly the same element in a job, as every other rater inconsistencies among the various raters will occur. In addition each rater must use each factor to measure the same element in each of the jobs which he rates. These two conditions are necessary to achieve accurate and equitable results.

Factor definitions should be written in simple clear and concise language. Every effort should be made to express exactly as to what the factor is designed to measure. The whole rating process can be expedited, if the factors are easy to understand and uniform interpretation is possible.

4.5 Degrees of factors:

In the discussion on the selection of factors, it was pointed out that the factors chosen should be important to and exist in the majority of the jobs in the range, which they are to rate. It does not mean that the factors exist in all the jobs to the same extent or degree. For example, every job in the series may require same formal education on the part of the incumbent, but

the jobs will differ in the amount of education required. Some may require not more than the ability to read and write, while others may require, as much education as is represented in a college degree. If the minimum specified education is a class 6th education, then degree 1 of education would be that amount. The next higher requirement for education may be found to a degree one education plus two years of school. Thus degree two of the education factor would be determined. The next higher level of educational requirements in the jobs may be high school certificate. In this way we can determine the degrees. If the none of the jobs called for more than the bachelor's degree, the scale should provide it as the highest degree level. Only the specific degrees required by the jobs are included. The jobs should be analysed in a similar manner for each factor and the degrees established to measure the range of the jobs under each factor.

After the degrees have been established, they must be defined as clearly, concisely and explicitly as possible. Where degree definitions are ambiguous, interpretation will vary widely among those using the scale. As a result job ratings will also vary widely and inequities will be perpetuated instead of being reduced or eliminated.

4.6 Relative Values of the factors:

The factor selected for a particular point scale

are chosen, because they are judged to be important to the majority of the jobs, for which the scale is being designed. But the factors are not of equal importance to all the jobs in the range. Some factors are more important than others, because the elements they measure have greater importance or value.

For example, if the factors for a particular scale were skill, effort, responsibility and working conditions, an analysis should be made of the four in terms of their respective values or importance to the jobs. Since skill typically represents such elements as knowledge, education, judgement, and analytical ability, obviously, the factor covers items of particular importance to the jobs and for which, an organization usually expects to pay more than certain items covered by other factors, such as working conditions, which include hazards and discomforts. Even these subfactors are of more importance than the job knowledge, educational background etc. Weighting of factors is an attempt to determine the relative value of the factors in terms of their respective importance to a particular range of jobs within an organization.

Sometimes within one organization factors may have to be weighted differently for each separate scale. For example, the scales designed for measuring the clerical jobs and factory jobs will be usually different. Working conditions might be included as a factor in both

of the scales, but its importance in both the scales would not necessarily be equal. The working conditions in most of the clerical jobs might be superior to that of factory jobs. Therefore, the importance attached to the factor "working conditions" in case of the clerical jobs would not be so high, as that of the factory jobs. As factors do vary in importance on a particular scale, as well as on scales designed to measure different ranges of jobs within the same organization. It is, therefore necessary for each organization to weight its own factors for its own particular scales. One concern should not attempt to adopt the scales of another concern without modification.

There are no exact formulae or guide lines for determining the relative worth of factors. The first step in determining the relative value of the factors is to have the factors ranked from low to high in order of their importance. Few top executives of the concern may be asked to do the ranking of all the factors in the same manner. The final rank order of the factors may then be determined by majority vote or by averaging the various ranking. This method of ranking the factors is basically the same, as the method of ranking the jobs, under the ranking method of evaluation. In assigning relative values to the factors, an assumption is usually made, that the total maximum value of all the factors equals 100 percent.

The problem of weighting is to divide this 100 percent among the factors according to the judged importance of the factors as determined by the ranked order of importance.

Now we have a foundation for preparing the scales for the organization. Even though the relative weighting of the factors may be acceptable to the organization, some additional check may be desirable to see, if the weightings are more or less in line with those used in other organizations. It has been stated, that the plan of one company will not fit the requirements of another exactly without sufficient modifications. However, Comparisons are helpful, since they show whether or not the findings of one organization are similar to those of others. Hence, if a company determines its own factor weightings, compares it with weightings used successfully in other organizations, and finds that they are alike, the weighting appears to be reliable (Fig.No.2).

A survey was conducted by the author to find, what factors others have chosen and what weights they have assigned to their factors. The findings of this international survey are tabulated in the chart.

4.7 Values of Degrees of each factors:

After the final factor weightings have been established, the next step is to assign the values to

the degrees of the factors. Two basic approaches to the assignment of point values to the degrees of factors exist, i.e. arithmetic and geometric. Under arithmetic progression, the points between the degrees of a factor are constant. When the geometric approach is followed, the points between degrees increase progressively. Actually some companies have assigned degree values arithmetically while others have used geometric progression and not specific reasons can be quoted for the superiority of any one. The only guide is that, the values assigned should be consistent and just. If the degree levels are so decided, that the difference between levels is approximately constant, the arithmetic progression approach can be applied. In the present plan, the degrees were so fixed, as to cover the factor in arithmetic progression and, hence the same approach is used, while assigning the values (Fig.No.2).

RATING SCALES

1.1 Educations

This factor refers to the basic knowledge necessary to prepare an individual for the job. This is the essential requirements to enable him to understand and pickup the training instructions. It is the background for future career.

Degree	Descriptions
1.	Ability to read, write and understand simple instructions. Addition and subtraction of whole numbers (Equivalent to school education of 4 years).
2.	Ability to read and write Hindi very well, should also be conversed with Roman letters and should recognize and interpret geometrical figures (school education of 6 years).
3.	Ability to read and write Hindi very well, should also understand simple English words and common sentences. Should have the basic knowledge of solid geometry and Algebra should be able to use simple equipments such as Thermometers, Barometers and Balances etc. (School education of 8 years or equivalent).
4.	In addition to the requirements for the degree 3, a person in this category also

requires the use of mathematics involving fractions and decimals. He should also understand simple terms of Physics and Chemistry etc. Ability to use measuring instruments such as Callipers, Diagonal scales etc. (School education of 10 years or equivalent).

5. Specialised education such as I.T.I. or some advanced studies in Sciences and Mathematics. Working knowledge of Engineering Drawing and English, to maintain production records etc. Have sufficient background for inplant training or advanced technological education (Two years after doing High School).
6. Requires Sufficient knowledge of Engineering Drawing, Shop Methods, and the use of general engineering metals. Or have the command over some professional subject such as Science, Commerce or Mathematics (A Diploma in Engineering or Graduate in pure subjects).
7. Requires sufficient background for technological knowledge and training. Well versed with the conventions of drawings and standards (A degree in Engineering).

1.2 Training

This factor appraised the requirements for the use

of shop calculations, practices and methods.

Degree	Descriptions
1.	Jobs requiring very short duration training or no training at all (Such as Helpers).
2.	For job which requires at the most 15 days of training on the work. (Such as an bank clerk or a drill operator).
3.	Requires the inplant training ranging from 15-60 days (Such as Truck driver).
4.	Requires the training of 2 to 6 months (e.g. Lathe turner).
5.	Jobs requiring training of 6 months to 1 year (Such as electricians, maintenance fitter etc.).
6.	Jobs which require long training such as 1 to 3 years (eg. Tools and Gauge Fitter, Die maker).
7.	Jobs which require training more than 3 years.

1.3 Experience

It appraises the length of time usually or typically required by an individual, with the specified education or trade knowledge, to learn to perform the work satisfactorily from the standpoint of quality, quantity and rejects under normal supervision. It includes only the time required to attain production standards after going through required education and training.

Degree	Time
1.	Upto three months

2. 2 to 6 months
3. 6 to 12 months
4. 1 to 3 years
5. 3 to 6 years
6. 6 to 10 years
7. 10 to 20 years
8. Over 20 years

1.4 Analytical Ability

It is the ability to make important decisions and do necessary planning, which the job requires. This factor also appraises the degree of complexity of the work.

Degree	Description
1.	Requires the ability to understand and follow simple instructions and the use of simple equipment where the employee is told exactly what to do.
2.	Requires the ability to work from detailed instructions and taking of minor decisions involving the use of some judgment.
3.	Requires the ability to plan and perform a sequence of operations, where standard or recognized operation methods are available. It includes making of general decisions for quality, tolerances, operations and setup sequences.

4. Requires the ability to plan and perform unusual and difficult work where only general operation methods are available and the decisions involving the use of considerable ingenuity, initiative and judgment.
5. Requires outstanding ability to work independently toward general results, devise new methods, meet new conditions necessitating a high degree of ingenuity, initiative and judgement on very complex jobs.

1.5 Mental Skill

Consider the mental ability, job knowledge, judgment, and ingenuity required to visualize, reasons through, and plan the details of a job without recourse to supervision.

Degree	Description
1.	Perform simple, repetitive routine tasks. Do simple sorting. Make changes in routine, only when closely directed.
2.	Make minor changes in routine or sequence on repetitive jobs involving selection, positioning, and recognition of obvious defects or adjustments, whose tolerances are liberal.
3.	Perform semi-routine job involving some variety of detail and requiring judgment. Sort material

2. Use large wrenches, slodges, hand tongs and heavy tools at a normal pace for a variety of tasks, use gauges and small tools in a routine manner. Use torch to perform rough cutting work. Operate variable controls, such as rheostats, and levers, to control movement of machines of passage of material through equipment where joggng, frequent regulation and precision of adjustment is required. Make simple adjustments and repairs to machines and equipment. Make setups for equipment where the use of tools and gauge is simple and routine.
3. Use several hand tools or trademans tools on assembly work, such as ladle timing, simple carpentry or pipe fitting or in making adjustments to machines or equipments where close tolerances are required. Perform simple gas or arc welding. Use hand cutting torch to burn to precision lay-out. Setup and operate machines tools for routine facing, drilling milling etc. Manipulat controls of complex machines at a rapid rate involving a high degree of coordination.
4. Use trademan's tools in a wide variety of difficult tasks involving close tolerances. Forge complex shapes without resorting to dies or templates. Finish complex sand molds etc.

- according to the size, weight, or appearance.
4. Reason through problems involving setup and operations on the complex equipment. Use considerable judgment in selecting and using material, tools and equipment in production, erection or maintenance work.
 5. Plan and direct the operation of a large complex production unit. Reason through and plan operating problems. Plan work details from complex blue prints.
 6. Analyze and plan complex non-repetitive tasks to be performed by skilled workmen.

1.6 Manual Skill

Consider the physical or muscular ability and dexterity required in performing a given job, including the use of tools, machines and equipment.

Degree	Description
1.	Use ordinary or heavy tools such as bars, wrenches, hooks etc. for performing simple or rough tasks, or where dexterity and pace are not of particular importance. Operate simple on-off switches, valves and lever controls. Handle ordinary material manually. Use chain or cable slings for simple crane hooking.

8. Perform difficult shaping or forming to close tolerances, where precise muscular control, and delicate touch are involved, such as making and assembling very small parts, precision instruments repair etc.

2.1 Responsibility for Material or Product

This factor appraises the responsibility for preventing waste or loss of raw material or partially finished product through carelessness. Consider the probable number of pieces which may be spoiled before detection and correction in any lot or run, the cost of material and labour, the possibility of salvage. It considers the average based on normal expectation.

Degree	Description
1.	Probable loss due to damage or scrapping of material is seldom over Rs.50/-
2.	-do- Rs.250/-
3.	-do- Rs.1000/-
4.	-do- Rs.5000/-
5.	-do- Rs.25000/-
6.	-do- is very large.

2.2 Responsibility for Equipment or tools

This factor appraises the responsibility for preventing damage, through carelessness, to the equipment

and tools used in the performance of job. It considers the probable damage resulting from carelessness in handling, setup, operation etc. for any one machine.

Degree

0.	Probable damage is negligible	
1.	-do-	about Rs.250/-
2.	-do-	about Rs.1000/-
3.	-do-	about Rs.5000/-
4.	-do-	Rs.25000/-
5.	-do-	Rs.100000/-
6.	-do-	Very high more than lacs.
7.	-do-	Very very high, may even cost whole of the plant.

2.3 Responsibility for work of others (Team work)

The factor appraises the responsibility which goes with the job for assisting, suggesting or preparing for the work of others.

Degree	Description
1.	No or very little responsibility for work of others.
2.	Responsible for instructing and directing one or two helpers, which if do not perform work properly will make further processing slightly

difficult.

3. Take himself the job, which, if not done in a particular way will create difficulties in the assembly or further processing.
4. If the maintenance of proper quality within range is proscribed, such as in some chemical industry. Any carelessness on the part of one chemist or operator will stop the work of every body in the line after him.
5. When the operator's carelessness makes it impossible to process it further, or instead doing good for team, he can put the whole of the team behind schedule, which will cause all of them monetary loss as well.

2.4 Responsible for safety of others:

This factor appraises the care, which must be exercised to prevent injury to others, and the probable extent of such injury. Consider possible accidents to others resulting from careless operation of machine or handling of materials or tools.

Degree	Descriptions
--------	--------------

- | | |
|----|---|
| 1. | Job performed in a isolated location, or where there is no machine involved, and the materials are very light. Very little responsibility for the safety of others. 0 |
|----|---|

2. Only little care to own work required to prevent injury to others. And, if any carelessness occur it is going to cause no injury, it will just make them annoyed and uneasy.
3. Very little care to own work required to prevent injury to others. And if any accident should occur, which would be minor in nature such as cuts, bruises, abrasions etc. It may cause their exposure to hazards.
4. Careless operation of machine or performance of duties may cause last-time accidents to others such as crushed toes, foot fingers or eye injuries.
5. Constant care necessary to prevent serious injury to others, due to inherent hazards of the job, but, where such other employees may act to prevent being injured. (such as gas leaking etc.).
6. Safety of others depends entirely on correct action of employee on the job being rated and carelessness may result in fatal accidents to others. (such as some explosion or fire).

2.5 Responsibility for supervision of others:

This factor appraises the responsibility for organization, leadership, and the guidance or direction of efforts of others. Scoring will depend upon the number of people normally supervised and the extent of the supervising responsibility.

D-380	Description
1.	Directs one to five assistants or helpers, with responsibility for correct completion of assignments, but generally working along with those supervised.
2.	Leader of a group usually more than five in number, seldom over ten. Assigns and checks work, assists and instructs as required, but performs the same work as those supervised or closely related work, most of the time.
3.	Supervisor or leader of a group, usually about 10 to 20, in number, but possibly smaller if difficult technical work requiring considerable direction and assistance. Plans, directs, and coordinates work, makes decisions and performs personally the more difficult aspects of the same broad assignments.
4.	Supervisor or foreman of a department, section or other independent unit usually of more than 25 employees, with responsibility for effective operations, maintaining schedules, planning work etc.
5.	Supervisor or foreman of a department or section performing work of considerable diversity and complexity, or of large group numbering over 50.

Supervisory, administrative and related duties occupy 100% of time. May include supervision of 1 to 3 assistant supervisors, who themselves spend majority of their time in supervisory and related duties.

2.6 Independency:

The existence or absence of personal or procedural control and guidance, on the basis of instruction, supervision and advice.

Degree Description

1. Work on simple, highly standardized jobs with little equipment or no other operations closely dependent.
2. Work on standard jobs with a little supervision. Personal ideas can be applied without consultation
3. No scope for free working. Operator must have the permission for doing anything.
4. He is not allowed to proceed as he thinks, He must follow the instructions blindly without argument.
5. No independency, he is required to get checked at every step.

3.1 Physical efforts:

The factor appraises the amount and continuity

of physical effort required. It includes the efforts expended in handling material, (The weight and frequency of handling), operating a machine or handling tools, and the periods of unoccupied time.

Degree Description

1. Light work requiring very little physical effort. No muscular movements required, no lifting or handling. Long pauses between work.
2. Operations over a machine where machining time exceeds the setting up and handling time. The tools and materials handled are light. Occasionally lifting of medium weight materials (such as changing of chucks etc.). Or handling of light weights frequently with small pauses in between.
3. Handling and lifting of medium weight materials or tools quite frequently with long rest pauses.
4. Lifting and handling of medium weight materials quite frequently with little rest pauses.
5. Lifting and handling of heavy weight parts and tools, with sufficient rest pauses, combined with handling of medium and light weight materials handling frequently. (such as a helper in stores).
6. Jobs requiring constant pushing or pulling, such as on drilling machines with hand feed. Requires the ability to use hand tools for hours without

pauses, such as chipping, filing or threading with taps in fitting shops.

7. Jobs requiring constant heavy forces, such as work on hand presses or hoists etc.

3.8 Mental efforts

It requires the ability to put up mental or visual concentration. The jobs requiring mental efforts and which require pauses without doing any physical efforts are considered.

Degree	Description
--------	-------------

- | | |
|----|--|
| 1. | Little mental and only intermittent visual attention, since either the operation is practically automatic or the duties require attention only at long intervals. |
| 2. | Frequent mental or visual concentration, where the flow of work is intermittent or the operation involves waiting for a machine or process to complete a cycle with little attention or checking. |
| 3. | Continuous mental or visual concentration, usually short cycle repetitive work of diversified operations requiring constant alertness. Or job duties requiring mental efforts such as careful studies of Drawings and technological sheets. Consultation of Hand books etc. with a view point of selection of proper formulae. |

4. Must concentrate mental and visual attention closely for planning and laying out complex work.
5. Concentration and exacting mental attention, usually visualizing planning and laying out very frequently, jobs involving complex items.
6. Very frequently using newly developed techniques, such as in industrial engineering and advanced design and design improvement sections.
7. Exacting concentration on moving or vibrating objects causing severe mental fatigue.

4.1 Hazards:

This factor appraises the hazards, both accident and health connected, even though all safety devices have been installed. It considers the material being handled, the machines, the tools used, the work position, and the possibility of accident.

Degree	Description
1.	Accident or health hazards negligible
2.	Accident's probability is very very low. The injuries are of minor nature, such as abrasion, cuts or bruises. Health hazards negligible.
3.	Probability is very low, though the accident may cause whole life disability, such as lost foot, crushed hand, loss of fingers etc. Health hazards are not expected.

4. Probability is very low, though the accident may cause whole life disability, such as eye injury from flying particles, any accident with head or face etc.
Some exposure to occupational disease.
5. Exposure to health hazards, which cannot be compensated, such as slow poisoning through gas inhaling or some thing like that.
6. Exposure to accident or occupational disease which may result in total disability.
7. Exposure to accidents, which will cause death at the spot.

4.2 Atmosphere

This factor appraised the surroundings or working conditions, under which the job must be done. Due consideration is also given to conditions with the features, which disturb the physical or mental well-being of employor provided these elements are beyond the control of employee.

Degree	Description
1.	Usual office working conditions, in a room fitted with light, fan and with good ventilation system.
2.	Some disagreeable factors present in office

working conditions which disturb the physical or mental well-being of the employee, such as poor ventilation, uneven temperature, dampness etc.

3. Best shop conditions, small clean work place. Assembly, inspection or supervisory jobs, requiring considerable time in the shop, where the employee is subjected to heat, cold, dampness, fumes, dust or steam etc.
4. Continuous exposure to several disagreeable elements or factors; especially dirty, oily noisy jobs. Almost continuous outdoor exposure.
5. Frequent exposure to severe working conditions, such as exposure to furnaces or boilers.
6. Continuous exposure to severe working conditions.

4.3 Temperature:

This factor appraised the temperature of surroundings or physical conditions under which the job must be done.

Degree	Description
--------	-------------

- | | |
|----|--|
| 1. | Normal conditions, there is only one fan for few workers, no cooler or air conditioning, no heater etc. |
| 2. | Outdoor duties, or no fan, or there are circulators but furnace etc. are there which cause high ambient temperature. |

3. High temperature of work place, near some furnaces etc. Or there are steam outlets etc.
4. Very bad working conditions.

4.4 Contact and Noises

This factor appraises the surroundings or physical conditions under which the job is performed with respect to the presence of disagreeable elements.

Degree	Description
0.	Ordinary working conditions such as in some office.
1.	There is water flowing on the floor, or oil and grease are there in the surroundings. Noise and vibrations are there.
2.	The operator is to put oil or grease quite often and these cannot be avoided. A lot of noise is there.
3.	The operator is using water or some oil etc., quite liberally, such as in service station etc. The fellow operators are uncleanable, or there are vibrations causing discomfort to the operator.

4.5 Class of Darkness

This factor appraises the visibility conditions of surroundings, under which the job must be done.

Consideration is given to the presence of any glare, spark, flame or moving light or poor visibility.

Degree	Description
0.	Normal conditions of visibility
1.	Sparks or intermittent light etc. or poor light arrangements.
3.	Continucus glare, flames or dark work place.
4.	Extremely intensed working conditions.
5.	Very dark work place.

CHAPTER V

Experimentation

As described in details in the 4th chapter, "Formulation of the plan" a "Job Evaluation plan" was developed. This was formulated after rigorous study of prevailing trades, job conditions and the workers. After studying the every department of Bharat Heavy Electricals Ltd., and their functions, the following sections were selected for study in detail:-

1. Non standard Equipments shop.
2. Special Equipments shop.
3. Electrical M/Cs Machining shop.
4. Winding shop.
5. Assembly shop (Electrical Machines).
6. Motor Garage.
7. Packing and Painting section.

In each of these departments, the workers of all cadres were studied to select few out of them, who represent the average worker on the job and in those selections departmental superintendents, Executive Engineers and Foremen etc. were consulted to leave no possibility of studying a non-representative worker. The workers selected were not told, that they are being observed, they were knowing only that few of them are to be observed, that is all.

The study was carried in a systematic manner and following information was gathered for each worker on the jobs:-

1. What he is supposed to do
2. What he is actually doing and
3. What he should do

The first thing "what he is supposed to do", was collected after interviews with the Supervisors or Foremen of the employee, the engineer connected to the section, and the recruitment section of the plant. The whole thing, that is expected out of him is termed as "job requirements".

Then the job were really studied and the actual working of the employee was recorded on the forms specially designed for this purpose. The whole things were mixed up and condensed to give the Job Descriptions. Thus a job description form for a job contains the fair work expected out of a employee, and the work, which he will be doing actually in the shop.

These description were used to analyse the jobs and to break up the job requirements into elemental requirements. Each element of the job was recorded, either in numerical values such as responsibility for material (Rs.500/-) or in the form of relative values such as noise level (high, low etc.). Each element was taken one by one, and that was recorded for all the

jobs, instead recording the job as a whole, for example, firstly the educational requirements for all the job were recorded to have correct and and proper relative degrees. Then the next element was taken and analysed.

After analysing, the jobs were evaluated in terms of degree values. Since the factor scales were ready to use, the approximate degrees were assigned to each elemental requirements. It required a lot of judgement and decision making, and the same precaution was taken. The jobs were evaluated as the basis of particular scale, first a scale was selected and all the jobs were rated with respect to this scale. Then the next scale was taken, and all the jobs were rated according to that. This procedure was repeated thrice for all the scales. Finally three figures for degrees of each element were recorded, and these were averaged to give the "Average Degree Value". Though very small variation was observed in the degree values for each job, but by doing the rating three times the chances of error and misjudgement were reduced.

These average degree values were converted into point values and summed up, to give the final point values for the jobs. The jobs were then arranged according to their point scores. And thus, we had the final list of sample jobs according to their relative worth, and it was found satisfactory.

CHAPTER VI

JOB STUDIES

6.1 Job Analysis:

It is defined as the process of determining by observation and study, and reporting pertinent information relating to the nature of a specific job. It is the determination of the tasks which comprise the job and the skills, knowledges, abilities and responsibilities required of the worker for successful performance and which differentiate the job from all others.

Job analysis not only includes a complete study of the job, but also includes an analysis of job conditions or the environments in which the job is performed. For the purpose of personnel administration, job facts are secured through job analysis for many reasons. Some of the more important ones are:

1. To provide facts for determining the relative worth of jobs -- Job Evaluation.
2. To determine the job requirements against which employee's performance may be measured - Merit Rating.
3. To determine requirements necessary to fill jobs - Selection and Placement.
4. To provide detailed information about, what the worker is to do in performing his job - Training.
5. To provide occupational facts necessary to the advising of workers - Vocational Counseling.

6. To point out dangerous and hazardous working conditions in order that remedial steps may be taken - Safety.
7. To provide facts about job duties and responsibilities in each area of operation - For better management, employee relationships and organizational structure.
8. To provide information on operation and procedures - Operating and procedures manual.
9. To clarify lines of responsibility and authority - Elimination of overlapping duties.
10. To classify jobs into an executive, administrative professional or non-supervisory category for the purpose of determining exemptions from minimum wage and overtime pay regulations - Compliance with law such as fair labour standards etc.

Job analysis is one of the most important steps in installing a job evaluation programme, since this procedure supplies the facts upon which the evaluation of the job is made. A company may set up an excellent organizational plan for installing a job evaluation programme, it may select and design its rating system with the greatest care, it may measure its job by that system with the greatest exactitude, and it may establish excellent policies of administration, control and maintenance of the programme. However, if

the facts upon which the jobs are evaluated are in error or are incomplete, all the effort, time and money spent in other phases of installation will be dissipated. Accurate evaluation or measurement can be achieved only if it is based on accurate and complete job facts.

6.2 Method for securing job facts:

There are two basic methods for securing job facts, the interview and the questionnaire. A third technique, actually a combination of the above two, is called the questionnaire and interview method. The interview method as conceived here implies observation of the performance on the job during the course of the interview. The interview method of securing job data has achieved its popularity because of its inherent advantages as a technique.

1. It permits securing of complete and accurate job information.
2. It avoids the necessity for employees to describe their work in writing, which is often very difficult for them to do.
3. It obviates employees having to complete questionnaire at home if their jobs do not provide facilities for work of this nature.
4. It enables the analyst to evaluate the importance of the data and sift the essential facts from the

non-essentials more accurately since, he personally has observed and talked about the job.

5. It provides standard nomenclature at the time the facts are secured and eliminates the labourious work of editing and standardizing the language and terminology of many employees and supervisors.
6. It provides an opportunity for the interviewee to get first hand information about the job evaluation programme from some one well qualified to give it, since the interview often begins with a preliminary discussion about the programme during which the interviewee may ask questions about the things which he does not understand.

6.3 Selection of personnel for giving job facts:

Employees or supervisors or both supply the analysts with this information, but more companies use both employees and supervisors than use either alone.

The practice of securing information from both employees on the job and the supervisors of the job is to be highly recommended since each serves to check the other as well as to supplement the knowledge of the other. In addition, this method provides for maximum participation, a very important thing in inspiring

confidence in the correctness of the facts upon which the jobs are to be rated. When each group is consulted and given an opportunity to express itself, they are more likely to feel that the jobs are to be rated on correct and complete facts.

When the combined plan of both questionnaire and interviews has been chosen, questionnaires may be secured from all employees. However, one or two of the better employees usually should be interviewed rather than all the employees on the job. After the data sheet for a job has been completed, all incumbents should be given a chance to approve it.

It is not difficult to decide which supervisors shall give information, since the immediately supervisor of the job is usually chosen. He may be required to check with his departmental head before he certifies his final approval, but he acts on his own authority in many companies.

CHAPTER VII

OBSERVATIONS AND RESULTS:

The following jobs were studied at the Bharat heavy electricals. The details of these studies are given on the following pages.

1. E.O.T. Operator
2. Carpenter
3. Painter
4. Assembly Fitter
5. Truck driver
6. Marker
7. Black smith
8. Hammerman
9. Forklift Operator
10. Gas Cutter
11. Winder
12. Assembler
13. Connector and Brazier
14. Shear Operator
15. Pipe Fitter
16. Electrician
17. Lineman
18. Cable jointer
19. Wireman
20. Electrical Fitter.

JOB ANALYSIS WORK SHEET

1. Job Title **Shear operator** Deptt. **Service & Erection**
2. Job Duties **Shear operations**
3. Equipment or Tools **88" Shear**
4. Formal Education Required **High School**
5. Time Required (i) To learn **1 months** (ii) To become **6 months** proficient
6. Knowledge of the job required.
7. Responsibility for
- | | |
|-----------------|--------------------|
| Material | Equipment |
| Rs.500/- | Rs.10,000/- |
| Team Work | Safety of others |
8. Concentration
- | | |
|--------|-----------------------|
| | life long loss |
| Mental | Visual |
9. Efforts
- | | | |
|---------------------|---------------------|-----------|
| considerable | considerable | Position: |
| Weight | Frequency | |
10. Working Conditions
- | | | |
|-------------------------|-----------------|-----------------|
| Heavy | moderate | standing |
| Atmosphere | Temp. | Noise level |
| normal | normal | High |
| Contacts | Light | |
| Oil & grease | normal | |
11. Hazards
- | | |
|-----------------------|-----------------------|
| Type | Probability |
| life time loss | quite frequent |
12. Leadership
- | | | |
|--------------|------|----------|
| Subordinates | Type | Location |
|--------------|------|----------|
13. Additional Requirement if any **nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **Pipe Fitter**
2. Job Duties **Pipe Fitting**
3. Equipment or Tools **Pipe Fitter's Jig.**
4. Formal Education Required **8th Class**
5. Time Required (i) To learn **1 year** (ii) To become **2 years** proficient
6. Knowledge of the job required.
7. Responsibility for

Material	Equipment
100/-	250/-
Team Work	Safety of others
difficulty for others.	difficulty for others.
8. Concentration
9. Efforts
10. Working Conditions

Mental	Visual	
normal	considerable	
Weight	Frequency	Position
medium	Medium	Bending
Atmosphere	Temp.	Noise level
Normal	outdoor	Medium
11. Hazards

Contacts	Light
Water & Paints	Normal
Type	Probability
Light	small
12. Leadership

Subordinates	Type	Location
nil.		
13. Additional Requirement if any

JOB ANALYSIS WORK SHEET

1. Job Title **Electrician** Deptt. **Central Maintenance**
2. Job Duties
3. Equipment or Tools **Simple Hand tools**
4. Formal Education Required **I.T.I.**
5. Time Required (i) To learn **18 months** (ii) To become proficient **3 years**
6. Knowledge of the job required.
7. Responsibility for
- | | | |
|--|-------------|------------------|
| | Material | Equipment |
| | 50/- | 100/- |
| | Team Work | Safety of others |
8. Concentration
- | | | |
|--|------------|------------------------|
| | nil | can cause death |
| | Mental | Visual |
9. Efforts
- | | | |
|--|---------------|---------------------|
| | normal | considerable |
| | Weight | Frequency Position |
10. Working Conditions
- | | | | |
|--|---------------|---------------|-----------------|
| | light | medium | standing |
| | Atmosphere | Temp. | Noise level |
| | normal | normal | low |
| | Contacts | Light | |
11. Hazards
- | | | |
|--|--------------------------|-------------|
| | sticky tapes etc. | |
| | Type | Probability |
12. Leadership **can have fatal shocks** **medium** Location
13. Additional Requirement if any **nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **Linsman** Deptt. **Central Maintenance.**
2. Job Duties **Wire fitting(indoor & outdoor).**
3. Equipment or Tools **Light hand tools.**
4. Formal Education Required **Intermediate.**
5. Time Required (i) To learn **1 year** (ii) To become proficient **2 years.**
6. Knowledge of the job required.
7. Responsibility for

Material	Equipment
100/-	250/-
Team Work	Safety of others
8. Concentration

Difficulty for others. can cause death	
Mental	Visual
9. Efforts

normal	normal	Position
weight	Frequency	
10. Working Conditions

normal	normal	standing
Atmosphere	Temp.	Noise level
normal	outdoor	low
Contacts	Light	
11. Hazards

dirt-dust	normal
Type	Probability
12. Leadership

light	small
Subordinates	Type Location
13. Additional Requirement if any **nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **Cable Jointer** Deptt. **Central Maintenance**
2. Job Duties **Cable Joining**
3. Equipment or Tools **Cable joining jig.**
4. Formal Education Required **High School**
5. Time Required (i) To learn **3 months** (ii) To become **2 years** proficient
6. Knowledge of the job required.
7. Responsibility for

Material	Equipment
500/-	50/-
Team Work	Safety of others
delays the work of others	nil
8. Concentration

Mental	Visual
small	small
9. Efforts

Weight	Frequency	Position
light	small	sitting
10. Working Conditions

Atmosphere	Temp.	Noise level
Good	normal	low
11. Hazards

Contacts	Light
dust etc.	Normal
12. Leadership

Type	Probability
light	small
13. Additional Requirement if any

Subordinates	Type	Location
nil.		

**Special Training sponsored by Cable Manufacturer
for all types of cables such as H.T., L.T., cables inclu
ding Aluminium conductors.**

JOB ANALYSIS WORK SHEET

1. Job Title **Wire man** Deptt. **Central**
2. Job Duties **Electrical repairs(indoor)** **Maintenance**
3. Equipment or Tools **Light hand tools.**
4. Formal Education Required **High School**
5. Time Required (i) To learn **18 months** (ii) To become **30 months** proficient
6. Knowledge of the job required.
7. Responsibility for
- | | | |
|--|--------------|----------------------|
| | Material | Equipment |
| | 250/- | 100/- |
| | Team Work | Safety of others |
| | nil | Isolated work |
8. Concentration
- | | | |
|--|---------------|---------------|
| | Mental | Visual |
| | normal | normal |
9. Efforts
- | | | | |
|--|--------------|-------------|-----------------|
| | Weight | Frequency | Position |
| | light | fast | standing |
10. Working Conditions
- | | | | |
|--|---------------|---------------|-------------------|
| | Atmosphere | Temp. | high level |
| | normal | normal | low |
-
- | | | |
|--|---------------------|---------------|
| | Contacts | Light |
| | sticky topes | normal |
11. Hazards
- | | | |
|--|--------------|--------------|
| | Type | Probability |
| | light | small |
12. Leadership
- | | | | |
|--|--------------|------|----------|
| | Subordinates | Type | Location |
|--|--------------|------|----------|
13. Additional Requirement if any **nil.**

I.T.I. Certificate is required.

JOB ANALYSIS WORK SHEET

1. Job Title **Electrical Fitter** Deptt. **Central Maintenance**
2. Job Duties **Repairing of electrical machines**
3. Equipment or Tools **Hand Tools**
4. Formal Education Required
5. Time Required (i) To learn **18 months** (ii) To become proficient **30 months**
6. Knowledge of the job required.
7. Responsibility for
- | | | |
|--|---------------------------------|---------------------------|
| | Material | Equipment |
| | 500/- | 250/- |
| | Team Work | Safety of others |
| | Stopage of line process. | accidents possible |
8. Concentration
- | | | |
|--|---------------------|---------------------|
| | Mental | Visual |
| | considerable | Considerable |
9. Efforts
- | | | | |
|--|---------------|---------------|----------------|
| | Weight | Frequency | Position |
| | medium | medium | sitting |
10. Working Conditions
- | | | | |
|--|---------------|---------------------|-------------|
| | Atmosphere | Temp. | Noise level |
| | normal | above normal | high |
- | | | |
|--|-------------------------|---------------|
| | Contacts | Light |
| | oil grease dust. | normal |
11. Hazards
- | | | |
|--|--------------|--------------|
| | Type | Probability |
| | sover | small |
12. Leadership
- | | | | |
|--|----------------|------|----------|
| | Subordinates | Type | Location |
| | about 5 | | |
13. Additional Requirement if any

I.F.I. Certificate is desired.

JOB ANALYSIS WORK SHEET

1. Job Title **Mechanical Fitter** Deptt. **Special Equipment shop.**
2. Job Duties **Mechanical jobs.**
3. Equipment or Tools **Medium hand tools.**
4. Formal Education Required **High School**
5. Time Required (i) To learn **2 years.** (ii) To become proficient **5 years**
6. Knowledge of the job required.
7. Responsibility for

Material	Equipment
500/-	50/-
8. Concentration

Mental	Visual
considerable	considerable
9. Efforts

Weight	Frequency	Position
heavy	high	complex
10. Working Conditions

Atmosphere	Temp.	Noise level
normal	above normal	high
11. Hazards

Contacts	Light
oils, dust etc.	normal
12. Hazards

Type	Probability
life long loss	small
12. Leadership

Subordinates	Type	Location
about 5		
13. Additional Requirement if any **nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **Truck Driver** Deptt. **Procurement (S.D.S.)**
2. Job Duties **Truck driving**
3. Equipment or Tools
4. Formal Education Required **High School**
5. Time Required (i) To learn **6 months** (ii) To become proficient **1 year**
6. Knowledge of the job required.
7. Responsibility for
Material **nil** Equipment **5000/-**
Team Work **Difficulty for others.** Safety of others **can cause death.**
8. Concentration Mental **normal** Visual **considerable**
9. Efforts Weight **light** Frequency **small** Position **sitting**
10. Working Conditions Atmosphere **below normal** Temp. **above normal** Noise level **high**
Contacts **oil & greese** Light **normal**
11. Hazards Type **life long loss** Probability **medium**
12. Leadership Subordinates **about 3** Type Location
13. Additional Requirement if any

Must have valid driving licence.

JOB ANALYSIS WORK SHEET

1. Job Title **Marker** Deptt. **Fabrication**
 2. Job Duties **Marks the paltes & angles etc.**
 3. Equipment or Tools **Protectors dividers etc.**
 4. Formal Education Required **Class 8**
 5. Time Required (i) To learn **1 year** (ii) To become proficient **3 years**
 6. Knowledge of the job required.
 7. Responsibility for

Material	Equipment
250/-	50/-
Team Work	Safety of others
Costly following operations.	nil
 8. Concentration

Mental	Visual
Considerable	normal
 9. Efforts

Weight	Frequency	Position
nil	nil	sitting.
 10. Working Conditions

Atmosphere	Temp.	Noise level
normal	normal	high
Contacts	Light	
dust -dirt.	normal	
 11. Hazards

Type	Probability
nil	nil
 12. Leadership

Subordinates	Type	Location
nil	nil	
 13. Additional Requirement if any **nil**
- nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **Black smith** Deptt. **Fabrication**
2. Job Duties **To remove the rolling defects,** **(M.S.E.)**
3. Equipment or Tools **General Smithy tools.**
4. Formal Education Required **Class 4**
5. Time Required (i) To learn **1 year** (ii) To become proficient **3 years**
6. Knowledge of the job required.
7. Responsibility for **Material** **Equipment**
Rs. 500/- **nil**
Team Work **Safety of others**
8. Concentration **Difficulty for others.** **Difficulty for others.**
Mental **Visual**
9. Efforts **Normal** **Frequency** **Position**
10. Working Conditions **Heavy** **Temp** **Complex**
Below Normal **Above** **High**
Contacts **Light** **normal**
11. Hazards **Water, cool etc.** **normal**
Type **Probability**
12. Leadership **light** **Coordinates** **small** **Location**
13. Additional Requirement if any **about 3**
nil.

JOB ANALYSIS WORK SHEET

1. Job Title **Hammer man** Deptt. **Fabrication**
 2. Job Duties **Hammering** **(N.S.E.)**
 3. Equipment or Tools **Hammer & other things.**
 4. Formal Education Required **nil**
 5. Time Required (i) To learn **3 months.** (ii) To become proficient **1 year**
 6. Knowledge of the job required.
 7. Responsibility for

Material	Equipment
100/-	nil
Team Work	Safety of others
nil	nil
 8. Concentration

Mental	Visual
normal	normal
 9. Efforts

Weight	Frequency	Position
heavy	high	complex
 10. Working Conditions

Atmosphere	Temp.	Noise level
normal	normal	
Contacts	Light	
dust- dirt.	normal	
 11. Hazards

Type	Probability
 12. Leadership

Subordinates	Type	Location
light	small	
 13. Additional Requirement if any **nil**
- nil.**

JOB ANALYSIS WORK SHEET

1. Job Title. **Fork lift Driver** Deptt. **Procurement**
2. Job Duties **To operate the fork lifter. (N.S.G.)**
3. Equipment or Tools **Fork lift.**
4. Formal Education Required **Class 6**
5. Time Required (i) To learn **6 months** (ii) To become proficient **2 years**
6. Knowledge of the job required.
7. Responsibility for **Material** Equipment
nil **Rs. 5000/-**
Team Work **Safety of others**
Difficulty for others. **can cause death.**
8. Concentration **Mental** **Visual**
9. Efforts **considerable** **considerable**
weight Frequency Position
10. Working Conditions **light** **normal** **sitting**
Atmosphere Temp. Noise level
normal **above normal** **normal**
Contacts **Light**
11. Hazards **oil & dust** **normal**
Type Probability
12. Leadership **light** **small**
Subordinates Type Location
13. Additional Requirement if any **about 3**

He must know the fundamentals of automobiles and about simple repairs which occur frequently.

JOB ANALYSIS WORK SHEET

1. Job Title **Gas cutter** Deptt. **Fabrication**
 2. Job Duties **Cutting the angles & plates.** **(N.S.E.)**
 3. Equipment or Tools **Gas cutting jig.**
 4. Formal Education Required **Class C.**
 5. Time Required (i) To learn **1 year** (ii) To become proficient **4 years**
 6. Knowledge of the job required.
 7. Responsibility for

Material	Equipment
250/-	250/-
Team Work	Safety of others
Responsible for inline process	accidents possible.
 8. Concentration

Mental	Visual
--------	--------
 9. Efforts

normal	considerable
Weight	Frequency
 10. Working Conditions

light	small	sitting
Atmosphere	Temp.	Noise level
below normal	above normal	high
Contacts	Light	
dust, dirt etc.	Very bad conditions.	
 11. Hazards

Type	Probability
------	-------------
 12. Leadership

gas inhaling	medium
Subordinates	Type
	Location
 13. Additional Requirement if any **about 2.**
- nil.**

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JOB ANALYSIS WORK SHEET

1. Job Title **Winder** Deptt. **Winding**
2. Job Duties **Placing & adjusting of coils.** **(Electrical Machines)**
3. Equipment or Tools **no special tools.**
4. Formal Education Required
5. Time Required (i) To learn **1 year** (ii) To become proficient **3 years**
6. Knowledge of the job required.
7. Responsibility for

Material	Equipment	1000/-
200/-		
Team Work	Safety of others	
Responsible for whole team.	nil	
8. Concentration

Mental	Visual
--------	--------
9. Efforts

Weight	Frequency	Position
light	high	complex
10. Working Conditions

Atmosphere	Temp.	Noise level
normal	normal	low
Contacts	Light	
not bad	good	
11. Hazards

Type	Probability
------	-------------
12. Leadership

Subordinates	Type	Location
--------------	------	----------
13. Additional Requirement if any **about 4**

He is required to study the drawings and to talk with the Russian Experts, if there is found any thing wrong during testing. So he must be well versed with Russian language.

JOB ANALYSIS WORK SHEET

- | | | | | |
|-----------------------------------|---|---------------------------|------------------------------|------------------|
| 1. Job Title | Assembler | | Deptt. | Assembly |
| 2. Job Duties | Main assembly, checking & handing over for inspection. | | (Electrical machines) | |
| 3. Equipment | General purpose hand tools. | | | |
| 4. Formal Education Required | Intermediate. | | | |
| 5. Time Required (i) To learn | 3 years | (ii) To become proficient | 6 years. | |
| 6. Knowledge of the job required. | | | | |
| 7. Responsibility for | Material | Equipment | | |
| | 5000/- | 5000/- | | |
| | Team Work | Safety of others | | |
| 8. Concentration | Slightly difficult | nil | | |
| 9. Efforts | considerable | considerable | Visual | Position |
| 10. Working Conditions | medium | small | Temp. | standing. |
| | Atmosphere | Temp. | Temp. | Noise level |
| | normal | normal | normal | low |
| | Contacts | Light | | |
| 11. Hazards | not bad | good | | |
| | Type | Probability | | |
| 12. Leadership | subordinates | nil | Type | Location |
| 13. Additional Requirement if any | about 8 | | | |

He must know all about each part, its importance, function and adjustments if any.

JOB ANALYSIS WORK SHEET

1. Job Title **Connector & Brazer** Deptt. **Winding**
 2. Job Duties **Brazing of Conductors etc.** **(Electrical Machines)**
 3. Equipment or Tools **Special Machine.**
 4. Formal Education Required **Class 8th.**
 5. Time Required (i) To learn **4 months.** (ii) To become proficient **1 year**
 6. Knowledge of the job required.
 7. Responsibility for

Material	Equipment
50/-	250/-
Team Work	Safety of others
 8. Concentration **Following operation is costly.**

Mental	Visual
nil.	nil.
 9. Efforts

normal	Frequency	Position
light	small	sitting
 10. Working Conditions

Atmosphere	Temp.	Noise level
good	normal	low
Contacts	Light	
Borase etc.	good	
 11. Hazards **nil**

Type	Probability
 12. Leadership

Subordinates	Type	Location
	nil	
 13. Additional Requirement if any **nil**
- nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **E.O.T. operator** Deptt. **Motor Production**
2. Job Duties **Crane operations.**
3. Equipment or Tools **Crane**
4. Formal Education Required **High School**
5. Time Required (i) To learn **1 year** (ii) To become **2 years**
proficient
6. Knowledge of the job required.
7. Responsibility for

Material	Equipment
nil	nil
Team Work	Safety of others
nil	can cause death.
8. Concentration

Mental	Visual
normal	considerable
9. Efforts

Weight	Frequency	Position
light	small	sitting
10. Working Conditions

Atmosphere	Temp.	Noise level
normal	normal	high
Contacts	Light	
Oil & grease.	good	
11. Hazards **nil**

Type	Probability
------	-------------
12. Leadership

Subordinates	Type	Location
nil.		
13. Additional Requirement if any **nil.**

JOB ANALYSIS WORK SHEET

1. Job Title **Carpenter** Deptt. **Packing & Painting**
2. Job Duties **Packing of wood cases.**
3. Equipment or Tools **Carpentary tools**
4. Formal Education Required **I.T.I.**
5. Time Required (i) To learn **1 year** (ii) To become proficient **3 years**
6. Knowledge of the job required.
7. Responsibility for
- | | |
|------------------------------|------------------|
| Material | Equipment |
| 500/- | nil |
| Team Work | Safety of others |
| difficulty for others | nil. |
8. Concentration
- | | |
|---------------|---------------|
| Mental | Visual |
| little | normal |
9. Efforts
- | | | |
|---------------|-------------|----------------|
| Weight | Frequency | Position |
| medium | high | complex |
10. Working Conditions
- | | | |
|-----------------|---------------|-------------|
| Atmosphere | Temp. | Noise level |
| good | normal | high |
| Contacts | Light | |
| not bad. | normal | |
11. Hazards
- | | |
|--------------|--------------|
| Type | Probability |
| light | small |
12. Leadership
- | | | |
|-----------------|------|----------|
| Subordinates | Type | Location |
| about 3. | | |
13. Additional Requirement if any
- nil.**

JOB DESCRIPTION FORM

Department Non Standard Equipment Shop Standard Code _____

Division _____ Standard Title _____

Location Fabrication Plant Title _____

Effective Date 7.2.68

Primary Function Hammering

Tools & Equipment Hammers of various sizes.

Level of Supervision _____

Education Exercised _____

Working Procedure _____

1. He is to do the hammering for black-smith.
2. He is required to do hammering during assembly.
3. Elongates the short in length pieces and rods etc.
4. Required for peening after welding.

JOB DESCRIPTION FORM

Department Special Equipment shop Standard Code _____

Division _____ Standard Title _____

Location Fabrication Plant Title Fitter (Assembly)

Primary Function Assembly of fabricated items.

Tools & Equipment General purpose fabrication tools.

Source of Supervision _____

Education Exercised _____

Working Procedure _____

1. Must be able to study and understand the shop drawings.
2. Must be conversant with the various shop tools & M/cs.
3. Must be able to manufacture the structures or parts as made out in drawings, with the help of others in the shop, such as welders & cutters etc.
4. Should know the standard methods employed in shops.
5. Should be able to direct and instruct the helpers to take efficient use of them.
6. Should be able to work independently.

JOB DESCRIPTION FORM

Department Special Equipment Shop Standard Code _____

Division Procurement Standard Title Driver (Truck)

Section _____ Plant Title Driver (Truck)

Primary Function To collect and supply the raw materials to the section.

Tools & Equipment Truck or tractor and simple Hand Tools.

Place of Supervision _____

Section Exercised _____

Working Procedure _____

1. He receives the indents from planning cell, and goes to stores or yard to collect the materials.
2. Directs the helpers to load materials in the best manner.
3. Drives truck to the shop.
4. He must be constantly alert for the safety of others on the road and inside the plant.
5. Controls the various levers & regulates the speed etc.
6. Should have obtained

JOB DESCRIPTION FORM

Department Non Standard Equipment shop Standard Code _____

Sub Division _____ Standard Title _____

Section Fabrication Plant Title Marker

Date 6.2.68

Primary Function _____

Tools & Equipment Scale, taps, divider, etc. Cord & chalk powder.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Receives the rough sketches from the charge man.
2. Do the marking with the help of charge-man or helper with the tight chord coated with chalk powder.
3. Then do the marking with center punch.
4. Check up the size etc. after gas cutting.
5. makes the required angles on plate with the help of compass or dividers.
6. Should be able to understand the drawings, should be knowing standard conventions of drawings.
7. Must be able to reproduce the drawing properly over the plates etc. along with allowances etc.
8. Should be able to do the marking independently.

Inherent work requirement:

Any other detail - He may be required to do some other work, after marking, along with the rest of the gang.

JOB DESCRIPTION FORM

Department Non Standard Equipment Shop Standard Code _____

Sub Division _____ Standard Title _____

Section Fabrication Plant Title Black-Smith

Date 7.8.68

Primary Function _____

Tools & Equipment General Type Black-Smith Tool.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. To do local heat treatment of small parts.
2. Do the straightening work of long strips or rods which are cut out.
3. Removes the rolling defects of rods & plates.
4. Must be well conversant with the shop operations such as drawing, bending, flattening, upsetting etc.
5. Should be able to use machines such as steam or air hammer
6. Should be able to take precautions to save himself and others in the shop.

Any other detail- Called generally for petty jobs.

JOB DESCRIPTION FORM

Department ~~Non-Standard Equipment Shop~~ Standard Code _____

Sub Division ~~Material Supply Gang~~ Standard Title _____

Section _____ Plant Title Fork lifter Operator

Date _____

Primary Function ~~Driving & Operation of Fork-lifter.~~

Tools & Equipment Fork-lifter, general purpose hand tools.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Drives the fork-lifter.
2. Places the heavy loads to be lifted at suitable places and adjusts them for safe carrying
3. Lifts the fork with the load.
4. Use of controls, to have smooth & appropriate movement of fork and vehicle.
5. Controls the fork-lifter, taking care for the safety of others and the load itself.

JOB DESCRIPTION FORM

Department _____ Standard Code _____

Sub Division Non Standard Equip. Standard Title _____

Section Fabrication Plant Title Gas Cutter.

Date _____

Primary Function Gas Cutting.

Tools & Equipment Gas cutting equipments.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be well conversant with cutting operations, over odd profiles.
2. Must know the functions and adjustments of all controls in the cylinder and gun.
3. Must be able to cut common materials in the shop.
4. Must know the consequences of gas inhaling and should be able to take proper safety precautions, to save others in the shop.
5. Should be able cut along st. lines, circles etc.
6. Should have passed the qualifying examinations.

JOB DESCRIPTION FORM

Department Special Equipment Shop Standard Code _____

Sub Division Raw Material Supply Standard Title _____

Section Services Erection I Plant Title Shear operator

Date 23.2.68

Primary Function Shear operation

Tools & Equipment Hand tools, scales, gauges etc.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must know about all controls & levers of the machine.
2. Should know the operation on two or three different types of shear machines.
3. Should regulate and control the speed of machine for safe efficient working conditions.
4. Should know the proper clearance and adjustments to cut plates of various materials, various sizes and different thickness.
5. Should be quite careful for safety of himself & others.
6. Should have good eyesight for doing accurate, precise, and fine cutting with the machine.
7. Should know about general maintenance of machine.

JOB DESCRIPTION FORM

Department ~~Non Standard Equipment~~ Standard Code _____

Sub Division _____ Standard Title _____

Section ~~Services Erection-I~~ Plant Title ~~Pipe Fitter - B~~

Date 23.2.68

Primary Function ~~Joining of pipes~~

Tools & Equipment Hand tools and pipe bending m/cs.

Source of Supervision _____

Direction Exercised _____

Working Procedure 1. Must be able to understand drawings, and

1. Must be able to understand drawings, and should know standard drawing conventions.
2. Should be able to decide the distribution of the work to the workers in the gang.
3. Should be able to work of pipe fittings etc. at the high altitudes, while using safety belts.
4. Must know the operations of pipe bending machines.
5. Should know gas cutting.
6. Should be well conversant with development of all types of shapes.
7. Should be perfect on bendh operations such as filing, sawing etc.

JOB DESCRIPTION FORM

Department Central Maintenance Electrical Standard Code _____

Sub Division _____ Standard Title _____

Section Electrical Repair Shop Plant Title Cable jointer.

Date 22.2.68

Primary Function Cable joining

Tools & Equipment Cable jointer's Reg.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be in a position to follow the drawings of the electrical line work and must be able to undertake the work independently.
2. Must understand clearly the functions and importance of each element in the line work, should know the importance of each type of cable in the linework.
3. Must be skillful and safety.
4. Must be knowing the methods of testing the cables, and should know the various methods adopted for different types, sizes of cables and cables for various ratings.
5. Should maintain sufficient amount of spares, tools, raw materials, and should always keep these things ready for use.
6. Should always try to minimise electricity failure hours.

JOB DESCRIPTION FORM

Department Central Maintenance Electrical Standard Code _____

Sub Division _____ Standard Title _____

Section Elect. Repairs Shop Plant Title Wireman

Date _____

Primary Function Wire fittings etc. (Indoor)

Tools & Equipment _____

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be in position to understand the drawings of the electrical wire work (indoor) and must be able to finish the work independently.
2. Must always follow the basic electricity acts and rules during wiring for houses & industries.
3. Must have leadership, and must know the individuals capacity and interest in the gang.
4. Must have fundamental knowledge such as the amount of current drawn by different electrical machines and appliances.
5. Must know electrical fire fighting & first aid
6. Must know the working on live lines.
7. Must be knowing the general carpensery work etc. and should masonry work also.
8. Should know the wiring for power, domestic, general and lighting work. Also know the special features for multistored buildings.
9. Should device economical and so far methods of giving temporary electrical connections for the working of lights and machines for small duration.

JOB DESCRIPTION FORM

Department _____ Standard Code _____

Central Maintenance Electrical

Sub Division _____ Standard Title _____

Section _____ Plant Title _____

Date **Elect. Repair Shop**

Lineman

22.2.68

Primary Function _____

Line establishment & maintenance (outdoor).

Tools & Equipment _____

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be in a position to follow the drawings of the electrical line work and must be able to undertake the work independently.
2. Must understand clearly the function & importance of each element in the installation or line work.
3. Should have leadership, and must be knowing the individual's capacity in his gang.
4. Must be always alert and safety.
5. Should always implement basic electricity acts and regulations during his entire work.
6. Must know the electrical fire fighting and first aid.
7. Must be quite tough to work himself and get the work done at heights, such as distribution poles, transmission towers etc.
8. Should be able to take up both construction and maintenance work of the lines.
9. Must be able to specify required space, hardware, tools, and raw material for constructions.
10. Should be in position to direct blacksmith to make electrical hardware fixtures.

JOB DESCRIPTION FORM
Central Maintenance

Department _____ Standard Code _____

Electrical

Sub Division _____ Standard Title _____

Electrical Repair Shop

Electrical Fitter

Section _____ Plant Title _____
22.7.68

Date _____

To make parts for electrical things.

Primary Function _____

Mechanical as well as Electrical Hand tools.

Tools & Equipment _____

Source of Supervision _____

Direction Exercised _____

Working Procedure ~~Must understand the electrical~~ as well as mechanical drawings, and should be able to understand standard conventions governing these drawings.

2. Must know the specifying of various hardware, insulating material and electrical accessories.
3. Should be highly skilled, to maintain the required accuracy, precision and quality of the work.
4. Should be able to direct machinists to get work done for small parts.
5. Should always follow basic electricity acts and regulations during his work.
6. Must be able to give first aid, and should know electrical fire fighting.
7. Must be in position to fix and test the electrical accessories and panels.
8. Should have general knowledge of using portable power tools, and brazing soldering etc.

JOB DESCRIPTION FORM

Department Central Maintenance Standard Code _____

Sub Division Electrical Standard Title _____

Section Electrical Repair Shop Plant Title Electrician

Date 22.2.68

Primary Function Construction and repairs of Electrical Equipments.

Tools & Equipment General purpose hand tools, portable electrical hand too

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be able to follow the drawings and must understand the working of the machines, he must be able to finish the job independently as per instructions.
2. Must have the clear idea of importance of each element in any sort of electrical network.
3. Must be in a position to spot out any dangerous points, which require much care during repairs and working.
4. Must be highly resourceful, and safety
5. Must always implement the basic electricity acts and rules during his entire work.
6. Should be knowing fighting electrical fires, and fundamentals of first aid.
7. Should be tough enough to work at heights or places such as tower crane, BOT cranes etc. ~~or similar work or similar work~~
8. Must be in a position to take up the -
 - a) Running maintenance
 - b) Preventive maintenance
 - c) Capital Repairs etc. as per schedules.
9. Should intimate the authorities for the requirements such as spares, tools, raw materials etc.

JOB DESCRIPTION FORM

Department Motor Production Standard Code _____

Sub Division _____ Standard Title _____

Section Packing & Painting Plant Title Crane Operator

Date 17.2.68

Primary Function Crane operation

Tools & Equipment Nil

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be Conversant with the various control levers.
2. Must be able to control speed and movement of the crane to have safe, efficient, smooth working.
3. Should be able to do routine cleaning & oiling etc.
4. Should be able to detect type of defect in case of, breakdown, to be reported to maintenance crew.
5. Must be constantly on the alert watching floor operations and workmen and should take safety precautions to prevent injuring men.
6. Must maintain his log-book.
7. Must know the correct capacity of each hoist (in case of two)
8. Instructs the workers to put the book at the best place.

JOB DESCRIPTION FORM

Department ~~Elect. M/C. Production~~ Standard Code _____

Sub Division _____ Standard Title _____

Section ~~Packing & Painting~~ Plant Title ~~Carpenter~~

Date 16.2.66.

Primary Function ~~packing of M/c in the wood case.~~

Tools & Equipment ~~General purpose carpentry tool.~~

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be able to study drawings to make packing accordingly.
2. Must be able to distinguish between various types of woods.
3. Must be able to understand a particular type of joint by name, and should be able to make a such joint.
4. Should be able to use various carpentry tools.
5. Should know the various adjustments in the tools and their sharpening etc.
6. Should be able to use carpentry machines.
7. Should be able to furnish the shop, when required.

JOB DESCRIPTION FORM

Department Electrical M/o Production Standard Code _____

Sub Division Motor Production Standard Title _____

Section Packing & Painting Plant Title Painter

Date _____

Primary Function Painting

Tools & Equipment Spray gun & brushes etc.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Must be able to prepare and mix the paints to obtain required type of paint.
2. Must be able to prepare surfaces before painting.
3. Should know the consequences of painting wrong type of paintover not properly prepared surfaces.
4. Must be able to do spray painting.
6. Should be able to write name and addresses etc. with or without the use of stencils.
8. Should be knowing the harmful effects of fumes and should know the proper precautions.
7. Should be able to read & write to maintain the proper records of the paints issued & used.

JOB DESCRIPTION FORM

Department ~~Electrical M/c Production~~ Standard Code _____

Sub Division Motors Manufacturer Standard Title _____

Section winding Plant Title Winder

Date 1.2.68

Primary Function winding the stators & rotors.

Tools & Equipment General Purpose hand tools, and few special purposes too

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Fix the stator in the winding machine.
2. Fix the ring for winding purpose.
3. Put the coils in the furnace.
4. Check the coils for proper amount of heating.
5. Place the coil into slot.
6. The coils are placed according to the drawings.
7. The slots will be wedged.
8. The gaps are adjusted to have equal spacings.
9. The extra part of the coils is to be removed (for rotors only)
10. The testing is done in his presence.
11. He is to detect the defect, if found in testing.

JOB DESCRIPTION FORM

Department Electrical M/c. Production Standard Code _____

Sub Division Motor Manufacturing Standard Title _____

Section Assembly Plant Title Assembler

Date 9.2.68

Primary Function Assembly of motor parts.

Tools & Equipment General purpose hand-tools.

Source of Supervision _____

Direction Exercised _____

Working Procedure _____

1. Read the drawing & Technology of the machine.
2. Preparation for assembly of the motor.
3. Check whether each part is inspected or not.
4. Actual assembly with the help of other too.
5. Handing over the machine to inspection personnels.
6. Checking the machine after inspection.
7. Machine handed over to tasting department.
8. Again checking after testing.

JOB DESCRIPTION FORM

Department Electrical M/c Production Standard Code _____

Sub Division Motors manufacturing Standard Title _____

Section Winding Plant Title Connector and Brager

Date 1.2.68

Primary Function _____

Tools & Equipment Brazing & Soldering m/cs.

Source of Supervision Foreman winding directs him to work.

Direction Exercised _____

Working Procedure _____

He must study the machine structure to so that can do the welding, soldering or brazing according to the required no. of poles, and no. of parallel paths. He is to follow the instructions given in the drawings. He will be present while inspection people conducts resistance test, if the resistance is unequal of the paths, the fault must be detected and removed. The resistance of all the parallel path should not vary by more than 0.2%.

Inherent work requirements: Do the soldering on various types of m/cs.

JOB GRADING FORM

Job Title	519 Connector & Brazer n.c.			3.2) Hammer man n.c.	
Factors	Weight	Average Degree	Points	Average Degree	Points
1.1 Education	8	3	24	0	0
1.2 Training	5	3.5	18	0	0
1.3 Experience	15	3	45	3	45
1.4 Analytical Ability	8	1	8	0	0
1.5 Mental skill	2	3	6	1	2
1.6 Manual skill	2	3	6	1	2
2.1 Responsibility for Material	5	1	5	15	7
2.2 Tools & equipment	5	1	5	0	7
2.3 Team work	5	3	15	0	0
2.4 Safety of others	5	0	0	0	0
2.5 Supervision	2	0	0	0	0
2.6 Independence	2	0	0	0	0
3.1 Physical Efforts	8	1	8	6	48
3.2 Mental efforts	8	1	8	0	0
4.1 Hazards	8	1	8	1	8
4.2 Atmosphere	3	3	9	2	6
4.3 Temperature	3	1	3	1	3
4.4 Contact or noise	3	1	3	4	12
4.5 Glare-Dark	3	1	3	0	0
Total	100		174		150

JOB GRADING FORM

Job Title	S. no.			S. no.		
Factors	Weight	17 Marker Average Degree	Points	18 Cable Joiner Average Degree	Points	
1.1 Education	8	3	24	4	32	
1.2 Training	5	6	30	3.5	18	
1.3 Experience	15	4	60	3.67	55	
1.4 Analytical Ability	8	2	16	1	8	
1.5 Mental skill	2	1	2	1	2	
1.6 Manual skill	2	4	8	2	4	
2.1 Responsibility for Material	5	2	10	2.5	13	
2.2 Tools & equipment	5	1	5	.25	2	
2.3 Team work	5	3	15	3	15	
2.4 Safety of others	5	0	0	0	0	
2.5 Supervision	2	1	2	0	0	
2.6 Independence	2	2	4	2	4	
3.1 Physical Efforts	8	0	0	2	16	
3.2 Mental efforts	8	2	16	1	8	
4.1 Hazards	8	1	8	1	8	
4.2 Atmosphere	3	4	12	3	9	
4.3 Temperature	3	1	3	3	9	
4.4 Contact or noise	3	1	3	1	3	
4.5 Glare-Dark	3	1	3	1	3	
Total	100	0	0	0	0	
			212		198	

JOB GRADING FORM

Job Title	S. nO.	Pipe fitter		S. nO.	E.O.T. operator
Factors	Weight	Average Degree	Points	Average Degree	Points
1.1 Education	8	3	24	4	32
1.2 Training	5	5	25	5	25
1.3 Experience	15	3.67	55	3.67	55
1.4 Analytical Ability	8	2	16	2	16
1.5 Mental skill	2	3	6	4	8
1.6 Manual skill	2	4	8	2	4
2.1 Responsibility for Material	5	1.5	7	0	0
2.2 Tools & equipment	5	1	5	0	0
2.3 Team work	5	1	5	0	0
2.4 Safety of others	5	2	10	5	25
2.5 Supervision	2	1	2	0	0
2.6 Independence	2	4	8	5	10
3.1 Physical Efforts	8	2	16	1	8
3.2 Mental efforts	8	1	8	3	24
4.1 Hazards	8	1	8	1	8
4.2 Atmosphere	3	4	12	3	9
4.3 Temperature	3	2	6	1	3
4.4 Contact or noise	3	3	9	1	3
4.5 Glare-Dark	3	0	0	0	0
Total	100		230		230

JOB GRADING FORM

Job Title	S. no. 13	Painter		S. no. 14	lift operator
Factors	Weight	Average Degree	Points	Average Degree	Points
1.1 Education	8	4	32	2	16
1.2 Training	5	5	25	4	20
1.3 Experience	15	3.67	55	3.67	55
1.4 Analytical Ability	8	2	16	2	16
1.5 Mental skill	2	2	4	2	4
1.6 Manual skill	2	4	8	2	4
2.1 Responsibility for Material	5	1	5	0	0
2.2 Tools & equipment	5	1	5	3	15
2.3 Team work	5	1	5	2	10
2.4 Safety of others	5	2	10	5	25
2.5 Supervision	2	0	0	0	0
2.6 Independence	2	3	6	2	4
3.1 Physical Efforts	8	2	16	1	8
3.2 Mental efforts	8	1	8	2	16
4.1 Hazards	8	1	8	2	16
4.2 Atmosphere	3	5	15	3	9
4.3 Temperature	3	2	6	2	6
4.4 Contact or noise	3	2	6	3	9
4.5 Glare-Dark	3	1	3	1	3
Total	100		233		231

JOB GRADING FORM

Job Title	S. nO.	Shear Operator		S. nO.	12 Truck Driver
Factors	Weight	Average Degree	Points	Average Degree	Points
1.1 Education	8	2	16	4	32
1.2 Training	5	2.5	13	4	20
1.3 Experience	15	2	30	3	45
1.4 Analytical Ability	8	2	16	1	8
1.5 Mental skill	2	6	12	3	6
1.6 Manual skill	2	1	2	3	6
2.1 Responsibility for Material	5	4	20	0	0
2.2 Tools & equipment	5	3.5	12	3	15
2.3 Team work	5	4	20	2	10
2.4 Safety of others	5	2	10	5	25
2.5 Supervision	2	3	6	0	0
2.6 Independence	2	3	6	2	4
3.1 Physical Efforts	8	1	8	1	8
3.2 Mental efforts	8	2	16	2	16
4.1 Hazards	8	3	24	2	16
4.2 Atmosphere	3	4	12	3	9
4.3 Temperature	3	2	6	2	6
4.4 Contact or noise	3	4	12	3	9
4.5 Glare-Dark	3	0	0	1	3
Total	100		241		238

JOB GRADING FORM

Job Title	S. no	Blacksmith		S. no Wireman	
Factors	Weight	Average Degree	Points	Average Degree	Points
1.1 Education	8	1	8	5	40
1.2 Training	5	5	25	5.5	28
1.3 Experience	15	4	60	3.67	55
1.4 Analytical Ability	8	1	8	2	16
1.5 Mental skill	2	4	8	3	6
1.6 Manual skill	2	4	8	1	2
2.1 Responsibility for Material	5	2.5	13	2	10
2.2 Tools & equipment	5	0	0	0.5	3
2.3 Team work	5	2	10	0	0
2.4 Safety of others	5	2	10	1	5
2.5 Supervision	2	0	0	2	4
2.6 Independence	2	1	2	1	2
3.1 Physical Efforts	8	5	40	2	16
3.2 Mental efforts	8	1	8	3	24
4.1 Hazards	8	3	24	3	24
4.2 Atmosphere	3	5	15	3	9
4.3 Temperature	3	2	6	1	3
4.4 Contact or noise	3	5	15	1	3
4.5 Glare-Dark	3	1	3	0	0
Total	100		263		250

JOB GRADING FORM

Job Title	S. no.	Electrician		S. no. Lineman	
		Weight	Average Degree	Average Degree	Points
1.1 Education	8	5	40	5	40
1.2 Training	5	5.5	28	5.5	28
1.3 Experience	15	3.67	55	3.67	55
1.4 Analytical Ability	8	3	24	2	16
1.5 Mental skill	2	4	8	3	6
1.6 Manual skill	2	1	2	1	2
2.1 Responsibility for Material	5	1	5	1.5	7
2.2 Tools & equipment	5	5	3	1	5
2.3 Team work	5	0	0	2	10
2.4 Safety of others	5	3	15	3	15
2.5 Supervision	2	3	6	3	6
2.6 Independence	2	0	0	1	2
3.1 Physical Efforts	8	2	16	2	16
3.2 Mental efforts	8	3	24	2	16
4.1 Hazards	8	3	24	3	24
4.2 Atmosphere	3	3	9	3	6
4.3 Temperature	3	1	3	2	3
4.4 Contact or noise	3	1	3	1	3
4.5 Glare-Dark	3	0	0	0	0
Total	100		270		266

JOB GRADING FORM

Job Title	S. S no.	Carpenter		S. S no.	Winder
Factors	Weight	Average Degree	Points	Average Degree	Points
1.1 Education	8	5	40	5	40
1.2 Training	5	5	25	5	25
1.3 Experience	15	4	60	4	60
1.4 Analytical Ability	8	3	32	2	16
1.5 Mental skill	2	3	6	5	10
1.6 Manual skill	2	8	8	8	16
2.1 Responsi- bility for Material	5	2	10	15	7
2.2 Tools & equipment	5	1	5	2	10
2.3 Team work	5	4	20	5	25
2.4 Safety of others	5	1	5	0	0
2.5 Supervision	2	1	2	1	5
2.6 Independence	2	1	2	3	6
3.1 Physical Efforts	8	3	24	2	16
3.2 Mental efforts	8	1	8	3	24
4.1 Hazards	8	2	16	1	8
4.2 Atmosphere	3	4	12	3	9
4.3 Temperature	3	2	6	1	3
4.4 Contact or noise	3	2	6	1	3
4.5 Glare-Dark	3	0	0	1	3
Total	100		237		230

JOB GRADING FORM

Job Title	S. no.	Assembler		S. no.	Carpenter	
Factors	Weight	Average Degree	Points	Average Degree	Points	
1.1 Education	8	5	40	1	8	
1.2 Training	5	6	30	6	25	
1.3 Experience	15	5	75	4.3	65	
1.4 Analytical Ability	8	3	24	4	32	
1.5 Mental skill	2	5	10	4	8	
1.6 Manual skill	2	3	6	5	10	
2.1 Responsibility for Material	5	4	20	2	10	
2.2 Tools & equipment	5	3	15	1	5	
2.3 Team work	5	1	5	4	20	
2.4 Safety of others	5	0	0	3	15	
2.5 Supervision	2	2	4	0	0	
2.6 Independence	2	1	2	2	4	
3.1 Physical Efforts	8	1	8	2	16	
3.2 Mental efforts	8	4	32	3	24	
4.1 Hazards	8	2	16	3	24	
4.2 Atmosphere	3	3	9	5	15	
4.3 Temperature	3	1	3	3	9	
4.4 Contact or noise	3	1	3	3	9	
4.5 Glare-Dark	3	1	3	3	9	
Total	100		305		301	

JOB GRADING FORM

Job Title	S. nO. 1	Mechanical Fitter		S. nO. 2	Electrical Fitter	
Factors	Weight	Average Degree	Points	Average Degree	Points	
1.1 Education	8	4	32	5	40	
1.2 Training	5	6	30	5.5	28	
1.3 Experience	15	5	75	3.5	50	
1.4 Analytical Ability	8	4	32	4	32	
1.5 Mental skill	2	4	8	4	8	
1.6 Manual skill	2	2	4	1	2	
2.1 Responsibility for Material	5	2.5	13	2.5	13	
2.2 Tools & equipment	5	1	5	1	5	
2.3 Team work	5	3	15	4	20	
2.4 Safety of others	5	0	0	0	10	II
2.5 Supervision	2	2	4	3	6	
2.6 Independence	2	1	2	1	2	
3.1 Physical Efforts	8	2	16	3	24	
3.2 Mental efforts	8	5	40	5	40	
4.1 Hazards	8	3	24	2	16	
4.2 Atmosphere	3	4	12	4	12	
4.3 Temperature	3	2	6	2	6	
4.4 Contact or noise	3	2	6	2	6	
4.5 Glare-Dark	3	0	0	2	6	
Total	100		321			

CHAPTER VIII

FORMULATION OF MERIT RATING PLAN

A merit rating plan resembles a job valuation plan in that it has factors, factor degrees, and point values. But, whereas the job valuation plan can be fairly complex, because its execution is done through trained industrial engineers these are organized in a specialized unit, the merit rating plan on the other hand, must be simpler, since it has to be applied to every employee individually by numerous supervisors in all parts of the company.

Q.1 There cannot be any specific plan to serve the purpose of every company. We can only discuss the merit and demerits of some plans which have been used successfully. For example take a plan which has been used to determine lay offs.

1. If two employees are equal in all respects, keep the one with the best work record.
2. If they are still equal, keep the employee who has been longest with the company.
3. If they are still equal, keep the more needy worker.

That is the plan in its entirety. The inadequacy of such an oversimplified procedure is obvious. In the first place two employees rarely have the same work

qualifications, but how can the company know and prove whether they do, without systematic records kept for the purpose over the whole period of the workers employment? And, if so, how can the relative merits of two employees be measured, especially without records? A real merit rating plan is much more than a list of vaguely expressed alternatives. It must make it possible for all supervisors to treat the employees on a fair and uniform basis so that workers will be laid off, rehired, or given merit raises, on the same basis in one department as in any other.

8.2 A very simple plan is illustrated in Fig.No.10 This is a sort of progress report in which supervisors make the ratings at a regular time interval. The whole plan is printed on cards, which are maintained in files and these cards are sent to supervisors on the first of every 3rd month and it takes a little time to rate a employee under him. Such an plan has the ADVANTAGES-

1. It requires little work of the supervisors to make the ratings.
2. The whole plan is printed on file cards, the clerical work is simple and inexpensive.

But such a simple plan is useful as the title suggests, only for indicating progress of the individual

employees. It does not make fine enough distinctions to serve the general purpose of a merit rating system. It merely separates the best and poorest workers from the typical ones. It would show too many employees with exactly similar average ratings, if an attempt were made to use it for determining lay offs or promotions. And also, there are so few factors that a supervisor could make or break an employee's record by a single error of judgment or slip of the pen in rating one of them.

8.3 Formulation of a Merit Rating plan

Keeping in view the above discussed plans, we can design a plan which will suit the Indian conditions well. The formulation will be carried on similar lines as that of a job evaluation plan.

Selection of Merit factors

The five standard basic factors, which can be combined or subdivided according to the special requirements are:

1. Job Performance:

The thoroughness, speed and accuracy of the employee in doing his job comprise the most important factor in any merit rating system. The efficient worker who does not waste materials or time by making mistakes is naturally valuable to the company. The

one of the best ways to measure over-all efficiency of most factory workers would be to keep a record of work produced. It is very important, in judging the job performance factor, to balance speed against thoroughness, accuracy, adherence to the required standards of workmanship and procedure and general efficiency.

In many jobs there is no mean of measuring quality by direct inspection. Here employee's work habits, such as skill and precision in handling tools or materials and carelessness in taking measurements etc. can be used to judge the performance.

In a very detailed plan, which will be quite complicated of course, "Knowledge of work" will be a separate factor from "Job performance". It is measured by the degree to which the employee is familiar with all parts of the job, his ability to use the necessary tools, his familiarity with the procedures and standard requirements, his efficiency in dealing with unusual cases, that are nevertheless covered by standard practices and his ability to increase production temporarily, in an emergency, without a loss of quality.

2. Industry and Dependability

An employee's job performance is the measure of how well he works. The 'industry and dependability' factor measures how much he works. Does he work steadily

while on the job? Is his attendance record good? Does he stretch out his rest periods and lunch hour? Next to actual performance on the job, this is the most important factor. It would be still more important except for the fact that really lazy and unreliable people do not ordinarily stay with a company long enough to require merit ratings.

3. Disposition and attitude:

This factor is necessary because every company must have team work to get results. A cooperative enthusiastic employee, who helps those around him, will often be of more value to the company than a mere efficient worker who is in everyone's hair. The best indication of this may be the person's attitude towards supervision. Does he accept orders cheerfully and understandingly, or does he resent them as though supervisors were a personal affront? A common symptom of poor attitude is continued complaining about other people--someone else should do more of the work or so and so should not have been promoted.

"Personal qualities and Ability to make contacts" are closely related to disposition and attitude. It includes appearance and habits. They also include such characteristics as modesty or conceit, confidence or instability, generosity or selfishness, intellectual

honesty or insincerity, interest in people or egoism. Smoothness of the company's operation depends on having in the right positions, people who are good enough to make intercompany contacts. The company's success in the business field depends on having good people for outside contacts. Many such men and women are to be found in the ranks of ordinary workers, and it is important to find them. And there is only one way to judge this particular ability when it is rated as a separate factor, and that is by results. Does the employe get other people to do gladly what he wants them to do? If so, he is a good contact man.

4. Judgment and Resourcefulness:

Initiative, judgment, and resourcefulness are such closely interrelated qualities that it is suggested that they should be treated together as one factor. A worker should be rated high in this factor if he can handle a job without instructions, if he can analyze an assignment and carry it through to completion with due consideration for all related factors, if he frequently suggests ways of improving his own job and uses the company's suggestion system (if there is any), and if he is able to foresee future situations and meet them effectively when they occur.

5. Aptitudes

This factor measures adaptability, general intelligence, breadth of understanding, and ability to learn to do new kinds of work. Does he know why he is doing his job the way he does, and what its relation is to other jobs and to the company's policies and over all operations? Does he have the right aptitude and the right kind of muscular dexterity for the general type of work he is in? Is he alert to what is going on around him? This factor must not be confused with 'Job knowledge'. Job knowledge is a measure of what has already been achieved, regardless of how long it took to achieve it. Ability to learn, though it must be judged from past performance, is a measure of potential future value. One worker may have taken three years to learn his job, and another may have learned the same job equally well in three months. Their job knowledge is equal, but the second worker obviously has greater ability to learn. This ability makes him more valuable to the company because his record indicates that he will be quick at learning any job he is assigned to.

Seniority as a Merit Factor

Objections to merit ratings are raised on the ground that seniority is not considered. Actually, length of service is an important factor in all merit plans.

If it takes normally a year to learn a job, most workers will not get high ratings in "Job performance or job knowledge" until they have been a year on that job. But, if a worker is an outstandingly quick learner his advancement should not be hindered by seniority considerations. Workers should understand that merit rating does give seniority credit to any employee who takes advantage of his experience to increase his job performance and knowledge of the work. Also the merit rating plan gives fair and immediate credit to a worker who has had experience on the same job, but with a different company, standard seniority systems do not allow for such outside experience.

8.4 Weighting of merit Factors:

The relative weights that should be assigned to the different factors are matter of choice with the company. The choice, like the selection of merit factors, will be based on the type of employees the company wishes to encourage. A sample plan is given in Fig. No.12. The percentage weightings of each factor can be found on this chart by dividing the highest rating point by ten. The suggested plan is known as the "block type" because there are individual blocks for the definition and point rating of each degree of each factor. Such plan results in more uniform ratings than

the simpler plans (Fig. 10 to 11) because the meaning of terms like poor and average is not left upto the supervisor but is defined by the statements in the blocks. Each definition is short and to the point, so that the supervisor will see immediately which factor he is rating and wheather the employee he is grading belongs to that degree.

CHAPTER IX

MERIT RATING PLANS

In this chapter four Merit Rating plans of different types are included. These are:

1. Questionnaire type
2. Classification type
3. Block type
4. Progress report type

9.1 Questionnaire for Merit Ratings:

Conduct and Character:

1. Anything wrong against his job expectancies ?
2. Anything wrong about his character ?
3. His general conduct is good in office.

Integrity:

4. His work/behaviour is favourable for the integrity of the departments work.
5. He criticises the Management/Department Heads/Senior Officers.
6. If yes for (5). Do you think it is constructive ?

Intelligence:

7. He applies his own intelligence to solve problems.
8. He consults reference books for technical classification.
9. He tries to solve the problems analytically.
10. Good in drafting and noting.

11. Discusses, takes pains for solution of the problem and cooperates others views.

Initiative and Resourcefulness:

12. He takes initiative by himself for major work
13. He takes initiative for solving problems.
14. Plans his work ahead.

Sense of Responsibility:

15. He finishes his assignments as expected from him in time.
16. He cultivates his responsibility as an officer.
17. Responsible for the loss of stationary/instrument.

Leadership and capacity for team work:

18. He has the capacity of controlling his subordinates fully.
19. He has good relation with his subordinates.
20. He has good relation with his colleagues.

Promptness:

21. He completes assignments promptly.
22. He grasps technical points promptly during discussions.
23. Hasten little time
24. Gives prompt and correct answer against enquiry.

Dependability

25. Does required amount of work.
26. Makes few mistakes.
27. He is reliable.
28. His job needs occasional supervision.
29. Loyal to his seniors.
30. Knows his job perfectly.
31. Out turn is satisfactory.

Capacity to handle difficult situations

32. He has faced trouble from supervisors/workmen for explaining his work and make them understand.
33. He works smoothly with worker/supervisors/engineers in the shop.

Readiness to accept new ideas

34. He accepts new ideas after analysing fully.
35. He accepts new ideas without any analysis.
36. He comes out with new ideas.

Knowledge of Procedures and Regulations

37. He knows Indian factory act, Safety act, Labour act etc.
38. He knows other general requisitions of the management.
39. He explains difficulties to his subordinates.

40. Obeys safety regulations.

Reasonability of Discipline:

- 41. He follows all the directions given to him without questioning.
- 42. He is strict in his daily work.
- 43. Punctual in attendance and go off.

Ability to express his ideas:

- 44. Can express his ideas orally ?
- 45. Can express his ideas in writing ?

Continous:

- 46. Keeps his work-place neat and clean.
- 47. Keeps his work tools in order.

Methodical:

- 48. Knows details of files, books etc.
- 49. Makes his own plan to keep things.

Relation with others:

- 50. Friendly with his subordinates/colleagues.

Improvements:

- 51. Makes satisfactory improvement.
- 52. Utilises his free time (if any) for good purposes.
- 53. Can undertake more responsible work.

Activity other than work:

- 54. Any connection with any union/organization.
- 55. Member of any committee.

Health

- 56. Good health

Leave

- 57. Leave taken in this period

Special notings:

- 58. Has been warned verbally ?
- 59. Has been warned in writing ?

9.2 Report of Efficiency Ratings:

As of..... based on performance during
period from.....to.....

Name.....Dept.
Section.....

1. Against the question mark employees:

- If adequate
- If work
- If outstanding

2. Underline the elements which are important in the
position.

- 1. Maintenance of equipments, tools, instruments.
- 2. Mechanical skill.

3. Skill in the application of techniques and procedures.
4. Presentability of work (appropriateness of arrangements and appearance of work).
5. Attention to broad phases of assignments.
6. Attention to pertinent details.
7. Accuracy of operations.
8. Accuracy of final results.
9. Accuracy of judgments or decisions.
10. Effectiveness in presenting ideas or facts.
11. Industry.
12. Rate of progress on or completion of assignments.
13. Amount of acceptable work produced.
14. Ability to organize his work.
15. Effectiveness in meeting and dealing with others.
16. Cooperativeness.
17. Initiative.
18. Resourcefulness.
19. Dependability.
20. Physical fitness for the work.

For employees in Administrative, Supervisory, or Planning positions.

21. Effectiveness in planning broad programs.
22. Effectiveness in adopting the work programs to broader or related programs.
23. Effectiveness in devising new procedures.

24. Effectiveness in laying out work and establishing standards of performance for subordinates.
 25. Effectiveness in directing, reviewing, and checking the work of subordinates.
 26. Effectiveness in instructing, training, and developing subordinates in the work.
 27. Effectiveness in promoting high working morals.
 28. Effectiveness in determining space, personnel and equipment needs.
 29. Ability to take decisions.
 30. Effectiveness in delegating clearly defined authority to act.
-

Standard	Adjective Rating	Numerical Rating
All underlined elements marked plus and no element marked negative	Excellent	1
A majority of underlined elements marked plus and no element marked minus.	Very good	2 or 3
All underlined elements marked atleast with a check, and minus marks fully compensated by plus marks.	Good	4 to 6
A majority of underlined elements marked at least with a check, and minus marks not fully compensated by plus marks.	Fair	7 to 8
A majority of underlined elements marked minus.	Unsatisfactory	9

On the whole do you consider the conduct of this employee to be satisfactory?

(yes or no)

Rated

Name..... Dated.....

Position..... Dept.

Checked by

Name..... Dated.....

EMPLOYEE RATING SHEET										UNSATISFACTORY	BELOW REQUIREMENTS	MEETS REQUIREMENTS	EXCEEDS REQUIREMENTS	VERY SUPERIOR	POINTS							
WORK <small>MENTAL & PHYSICAL</small>										7	11	15	18	20								
SKILL <small>EDUCATION & EXPERIENCE</small>										13	21	27	32	36								
RESPONSIBILITY <small>(MAT'L, EQUIP, SAFETY, SUPERVISION)</small>										7	11	15	18	20								
INITIATIVE & INGENUITY										7	11	15	18	20								
SENIORITY		LESS THAN 3 MONTHS		3-9 MONTHS		9-18 MONTHS		18 MONTHS & OVER														
		0		6		8		10														
RESPONSIBILITY FOR MATERIAL		EXTREME SPOILAGE		EXCEEDS ALLOWED SPOILAGE		ALLOWED SPOILAGE		NO SPOILAGE														
		0		3		4		5														
RESPONSIBILITY FOR EQUIPMENT		NO REGARD FOR EQUIPMENT		CARELESS USE OF EQUIPMENT		REQUIRED CARE OF EQUIPMENT		GREAT CARE IN USE OF EQUIPMENT														
		0		3		4		5														
ATTENDANCE, RELIABILITY		VERY POOR		POOR		GOOD		VERY GOOD														
		0		3		4		5														
PER CENT OF STANDARD PRODUCTION																						
LESS THAN 33%	33 to 37	38 to 41	42 to 45	46 to 49	50 to 53	54 to 57	58 to 61	62 to 65	66 to 69	70 to 73	74 to 77	78 to 81	82 to 85	86 to 89	90 to 93	94 to 97	98 to 101	102 to 105	106 to 109	110 to 113	114 to 117	118 and over
POINTS	19	23	25	29	32	35	38	42	45	48	51	54	58	61	64	67	70	74	77			
REMARKS										TOTAL POINTS												
NAME										DEPT.												
RATED BY										CK'D BY												
DATE																						

EMPLOYEE RATING SHEET

FIG. NR. 11

FACTORY EMPLOYEE, PROGRESS REPORT.

Name

Social Security No.

Rating Key		Ratings								
		Date	Jan.	Feb.	Mar.	Apr.	May	June	July.	
ABOVE AVERAGE		Department								
AVERAGE		Payroll No.								
BELOW AVERAGE		Job Card No.								
	POOR	Pay Rate								
34	26	17	9							
20	15	10	5							
18	14	9	4							
14	10	7	3							
14	10	7	3							
TOTAL RATING POINTS										
GRADED BY										

FACTORY EMPLOYEE, PROGRESS REPORT.

CHAPTER X

DISCUSSION ON THE METHOD:

Now, that the basic plan has been completed, analyzing jobs and writing job descriptions have been performed in preparation for rating the jobs. Under the point system, the actual job evaluation can be handled most efficiently by industrial engineers assigned from the job-evaluation department, aided by the supervisors and individual workers concerned. The success of this part of programme depends upon the ability of the evaluators to obtain complete cooperation both from workers and from supervisors at all levels.

The greatest weakness in most programmes is the failure to interest the supervisors soon enough. If a supervisor does not understand from the start what the ultimate results of the procedure will be, he will do his part of the work too casually. Therefore, every supervisor must be encouraged to understand thoroughly the definitions of factors and factor degrees; the meaning of point ratings; the importance of thinking in terms of jobs, not the men who hold them and the fact that jobs in his department or group must line up with similar jobs in other departments of the company.

For the present work there was none, but actually there are two major choices available to an organization

in determining as to who shall rate its jobs. The first choice is that of selecting one individual to rate all jobs, the second is that of selecting a committee or a number of committees to perform this function.

When one individual is selected, he rates all the jobs in series. The major advantages of this choice are:

1. It expedites the rating process.
2. It provides uniformity in rating
3. It eliminates the necessity of trying to find a number of qualified raters.

The major disadvantages of this choice are:

1. It eliminates wide spread participation and may reduce confidence in the results.
2. The rating may reflect the rater's prejudices, since there are no other opinions available to balance his views.
3. It fails to provide the same degree of personal knowledge and familiarity with the jobs, that several raters may provide since one person usually does not have so complete information about an organization and its jobs as several do.

Under the committee system of rating, a group of individuals is chosen to rate the jobs. Members of the committee may pool their judgment and rate as a group, or they may first rate independently and then pool the

results of their independent rating to arrive at the final rating. The procedure of rating independently first and then pooling the results is recommended over pooling judgment in the beginning, because it forces each rater to exercise his own judgment and eliminates the possibility of an individual being dominated by a more forceful personality or someone higher in rank, at least in the initial phases of the rating process.

Because participation, reduction in bias and prejudice, and provision for personal knowledge about jobs are all very important in securing accurate and acceptable ratings, the committee plan of organization is the more popular of the two and is to be recommended more highly than the individual plan of rating.

Accuracy in Rating:

The importance of accurate job rating cannot be overemphasized. The basic purpose of the whole evaluation process is to determine the correct relationship among the jobs being rated. It is by this relationship primarily, that fair wage and salary rates will be gained, and that an organization will establish a defensible basis for negotiating with workers. A rater is bound to make certain mistakes unless he understands what these are, and is helped to avoid them. Some of these common ones are:-

1. Halo Effect:

The tendency to rate every factor of the job high or low, because the first factor rated or the most important factor to the job was assigned a high or low value, or because the general impression about the job is, that it is of high or low value.

2. Central tendency:

The tendency to adhere to a middle course and rate most factors in the job neither high nor low, but at midpoint on the scales.

3. Leniency:

The tendency to allow the benefit of the doubt in cases, where decision is not clear-cut, or to avoid rating jobs low on any factor or in total value.

4. Minimization:

The tendency of minimizing the importance of any factor in a job or the total value of the job, or not to allow the benefit of the doubt in cases, where the decision is not clear cut.

5. Bias or prejudice:

The tendency to favour or discriminate against a job, because of personal feeling.

The tendency toward the "halo effect" may be

roduced, if the rater will rate all the jobs on one factor instead of rating each job on all factors proceeding to the next job. The errors of central tendency, leniency, harshness, and bias and prejudice are relatively easy to detect, if scores of the various raters are compared. Where evidence is found, that any of the raters are committing such errors individual conferences should be held with them, to get the cause.

Errors may be due to misunderstanding the rating scales or the job description, not knowing enough about either of these two tools, or having an incorrect attitude about the work itself. When the cause of the error has been determined, steps should be taken to eliminate it, such as giving the rater additional training and guidance in understanding and using the scales and the description, supplementing his information, and trying to correct his attitude towards his work.

The rater should study each job description in detail and should certainly understand the jobs, before he starts rating. He should know that, if there is any doubt about any of the facts, he should seek clarification before proceeding with the rating.

Despite the fact that every effort may have been made to ensure accurate and consistent rating,

errors and inconsistencies do occur in the initial process of evaluating the jobs. To minimize these errors, initial job ratings should be analyzed, rechecked and cross-compared, before they are accepted as representing the final relative values of the jobs, it is called verification.

Job ratings, not only require verification, they also must be horizontally and vertically equitable throughout the organization. Management and employees both want assurance, that the jobs within one department are rated like comparable jobs in other departments. For example, if the fitter in one department performs basically the same duties as the fitter in another department and the job requirements are the same, the jobs should have the same rating. This is known as horizontal equity. In addition, the jobs within each department should be in their correct relative order of importance from low to high in relationship to all other jobs within the company. This error is called vertical equity.

If job relationships are not horizontally and vertically correct, many administrative problems may arise. The resulting lack of confidence in the job evaluation program may endanger its continuing existence. If one or more departments get the reputation of securing higher evaluation for their jobs, than others do,

administrative officials may be plagued with requests for transfers to these departments, while they have difficulty in recruiting for the departments in which the jobs have lower ranks. Since the basic purpose of job evaluation is to determine the correct relative values of jobs, this purpose will be defeated, if jobs are either horizontally or vertically out of line. In order to ensure that, an equalization of ratings must take place, all the original evaluations should be rechecked and submitted to the most careful analyst possible. This procedure will usually eliminate or reduce the errors made in writing, a good well worth the time, effort, and cost involved.

The factor comparison system is the most recent of the four basic systems. Its leading advocate has been Eugene, J. Borge¹¹. Borge objected to the point system on the grounds, that:

1. It assumes all jobs to be composed of the factors that are selected.
2. Point values are assigned to degree levels of the factors in an arbitrary manner, especially the upper limits of the factor.
3. The point system contains "ooming refinements" which are unjustified.
4. The unit of measurement namely "the point" is undefined.

5. Factors are frequently not defined.

6. The final value of a job is based on a job analysis rather, than a comparison of the job with other jobs.

Advocates of the point system reply to objections 1,2,3,5 and 6, as applying to factor comparison system also. The objection 4 is claimed to be an advantage, rather than a disadvantages.

One definite advantage of the factor comparison method is, that it is tailor made for each company, since the primary basis for evaluating jobs is to compare them with selected "key jobs" in the company. The relative position of these key jobs constitutes the steps of the rating scales and since the key jobs in one company are, if ever, the same as those in another, each company is forced to construct its own factor comparison plan. On the other hand, key jobs like any job, are subject to change and as soon as this happens, the scale of measurements also changes.

Probably the strongest criticism of factor comparison system is the establishment of scales on the basis of monetary units. It is felt by many that this introduces a biasing or contaminating features, thus that job analysts will be influenced by the current wages being paid for the jobs, and this in turn may prolong existing inequities, contrary to the purpose of job evaluation plan.

The point rating system is generally considered to be the most commonly used system in the industry. It utilizes rating scales to measure specific job characteristics, or factors, which are common to many jobs - for example education, amount of supervision exercised, on the job training time, etc. Each factor is assigned a certain number of points on the basis of its judged relative worth, as compared with other factors. On the basis of this point value, each level or degree, in the rating scale for each factor is assigned a point value. Each job is then considered separately for each factor and evaluated against the approximate factor scale. The points obtained by each job in various factor ratings scales are then summed, and the total represents the relative worth or difficulty of the job.

The point system is more complicated than others, it is more difficult and require more time to construct, considerably more paper work is involved. However, the fact that it is most popular method would seem to indicate, that it has advantages, which outweigh the disadvantages. Once in use, both management and workers can understand it with ease and, what is most important, independently reach similar point values of the job. Rater agreement is high, and this is important, if the concept of rater agreement may be accepted as a criterion for validity of job rating.

CHAPTER XI

CONCLUSIONS:

Job analysis is the review study of definite jobs, to ascertain, what kind and what degree of man-qualities are necessary to make man job units operate satisfactorily.

Job evaluation is the extension of job analysis to ascertain reliably, the relative worth of jobs, to transform these appraisals into a structure of adequate rates, and to provide standard procedures for all additions to and adjustments in, the rate structure.

Primary Purposes:

1. To establish a general wage level for a given plant, which will have parity, or an otherwise desired relativity, with those of neighbour plants, hence with the average level of the locality.
2. To establish correct differentials for all jobs within the given plant.
3. To bring new jobs into their proper relativity with jobs previously established.
4. To accomplish the foregoing by means of facts and principles which can be readily explained to, and accepted by, all concerned.

Job Evaluation:

Can become a control of importance -

1. By reducing all essential job facts to convenient form, it enables a management to implement policies of fairness.
2. By adopting sound principles and impartial techniques, it trains the supervisory force to more nearly objective.
3. By clarifying lines of authority and responsibility it obviates misunderstanding.
4. By substantiating confidence it lessens grievances and simplifies wage negotiations.

Secondary Purposes of Job evaluation:

The sole aim of many managements in adopting job analysis between 1914 and 1937 was to use it as an aid to hiring. All such assistance and more can come from extending job analysis or through job evaluation:

1. To determine qualities necessary for a job, when hiring new employees.
2. To determine qualities necessary for a job, when making promotions.
3. To determine, if the system of advancement in a particular plant is free to job of lowest order toward the job of highest order.

4. To determine qualities necessary, when bringing back men, who have been laid off or have been on leave. During the interval there may have been changes in job content.
5. To support explanations to employees, as to why a particular man could not be suitable for a given opening. Many seniority clauses give preference to length of service only after the requirements of the job in the way of experience etc. are satisfied. If the job rating has been made up by an independent agency, and the entire plant has been rated, there is likely to be less stress on mere seniority.
6. To determine, if men now occupying various jobs have qualifications required by the specifications.
7. To determine, if all men are placed to best advantage in respective jobs available, also to guide the revamping of jobs for skill conservation.
8. To analyze hourly rates to determine, if they are in line with rating given.
9. To compare periodically wage rates with those for similar occupations at other local plants.
10. To point out, where greatest opportunities lie for development of automatic equipment and

improvement of working conditions, removal of hazards etc. Obviously a company would be in a much better position, if all jobs could be reduced to the level of the lowest rating, thus making it possible to employ all unskilled labour, working under ideal conditions.

Any plant where job ratings are very high, indicating a predominance of highly skilled labour usually is a plant, where there are very few automatic operations. High ratings indicate places, where it is most likely that improvements in equipment can be justified.

11. To train new supervisors, specification outlining duties of each man are useful in starting a new foreman on job. Even an old foreman may have a wrong conception of job content and worth.
12. To facilitate explanations to an employee of the fact, that any improvement in working conditions theoretically should mean a reduction in his wage rate.

On the basis of the present work and literature available the following conclusions can be drawn:

1. The job conditions in Indian Industries are very much different to those in developed countries.
2. The plans, which have been given in the books, cannot be applied reasonably to these conditions.

3. The proposed plans may look similar to traditional ones on first sight, but these are quite different.
4. The selection of factors and assigning of relative values to these factors have been done after studying the working conditions, job requirements and descriptions etc.
5. The job evaluation plan, after application to few trades gave quite reasonable relative position.
6. The merit rating plan cannot be applied within this short time, and hence cannot be checked.
7. But it seems quite reasonable, and it can be assumed that it can be applied to Indian Industries, and can be modified, if any thing is found going wrong.

CHAPTER XII

SCOPE FOR FURTHER WORK:

A very elaborate rating system is needed, if the theory presented here is to be completely and effectively checked. It is suggested that the human-factor should be eliminated. It is obvious, that human-judgment factor cannot be eliminated, but every effort should be made to reduce it.

Unfortunately, at the present time, no particularly reliable statistical method exists for determining the reliability and validity of job ratings. The element of human judgement enters into evaluation to such an extent, that the usual statistical techniques for determining reliability and validity do not appear to produce the results in this field, that they do, when human judgement is relatively unimportant. The real test of a job evaluation programme is its acceptability to management and employees. This acceptability typically depends upon internal equity in both horizontal and vertical directions.

Hence a method is to be evolved which will still be systematic and will be using very little of judgement. No doubt, those systems will be quite complex in nature, but will yield better results.

Regarding merit rating plans, there exists a wide scope for further work. The limiting condition is

that a rating plan should be very easy, because it is to be used by supervisors and foremen etc. and those persons are not conversant with Industrial Engineering techniques. And it is well established fact, that a merit rating plan without unbiased and fair raters is of little use to organization. Hence a honest organizational structure is essential alongwith a good merit rating plan.

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TABLE No. 1

RESULT OF SURVEY OF JOB EVALUATION PLANS

Sl. No.	FACTORS	N.Y. REVA	M.A., Steel	N.A., Steel	American (S.S.C.) (Co. USA House)	Alfred C. Westing House	France	GPA	Stevens	Sweden	H.S.L. Rourkela	B.H.S.L.
1.	Education	14	16	2.3	18.5	18.5	12.96	14	5.75	12	10.8	10.8
2.	Experience	28	14	9.3	18.5	18.5	12.96	14	13.2	10.00	14	16.5
3.	Analytical Ability	14	20		23.2	23.2	11.76	8	10.00	10	10.6	24.7
4.	Mental Skill				60	60		6	7.55			
5.	Manual Skill			8.8				6			5	
Responsible for												
6.	Precision			4.6					10.00			6.6
7.	For Material or Product	6	8	23.2	4.63	4.63	5.88					
8.	For Tools and Equipment	6	7	8.3	4.63	4.63	5.88	12	5.66	10.00	10	2.8
9.	Work of Others	6		16.1	12.5	12.5	5.88		5.66	5.75	6	3.5
10.	Safety of others	6		4.7	4.63	4.63	5.88		5.66	10.00		
11.	Supervision Exercised											
Efforts												
12.	Physical	10	6	5.8	6.25	6.25	8.23		15.00	14.80	8	7.0
13.	Mental or visual	6	9	6.8	6.25	6.25	8.23		7.50	4.20	6	10.00
14.	Manipulative or coordination						6.00					
15.	Complexity						8.23					
16.	Attention								3.78			
Conditions												
17.	Hazards	6	6	4.7	6.25	6.25	5.88	7	4.73	2.83	5	15.00
18.	Atmosphere						6.66	7	5.88	5.66		6.60
19.	Temperature						6.23	7	6.66	14.80	7	2.80
20.	Contact or noise						13.33	4	4.73	4.72		
21.	Clare or Dark							7	2.83			
22.	Mentality							6				
23.	Independence				12.50	12.50						

PROPOSED JOB EVALUATION FACTOR WEIGHTINGS

SNO		MAJOR FACTOR	MINOR FACTOR	POINTS	POINTS
1		Skill		40	
	1.1		Education		8
	1.2		Training		5
	1.3		Experience		15
	1.4		Analytical Ability		8
	1.5		Mental skill		2
	1.6		Manual skill		2
2		Responsibility for		24	
	2.1		Material or Product		5
	2.2		Tools and Equipment		5
	2.3		Work of others		5
	2.4		Safety of others		5
	2.5		Supervision		2
	2.6		Independence		2
3		Efforts		16	
	3.1		Physical		8
	3.2		Mental or Visual		8
4		Working Conditions		20	
	4.1		Hazards to self		8
	4.2		Atmosphere		3
	4.3		Temperature		3
	4.4		Contact or Noise		3
	4.5		Glare or Dark		3
			TOTAL	100	100

PROPOSED PLAN

FIG. NO. - 1

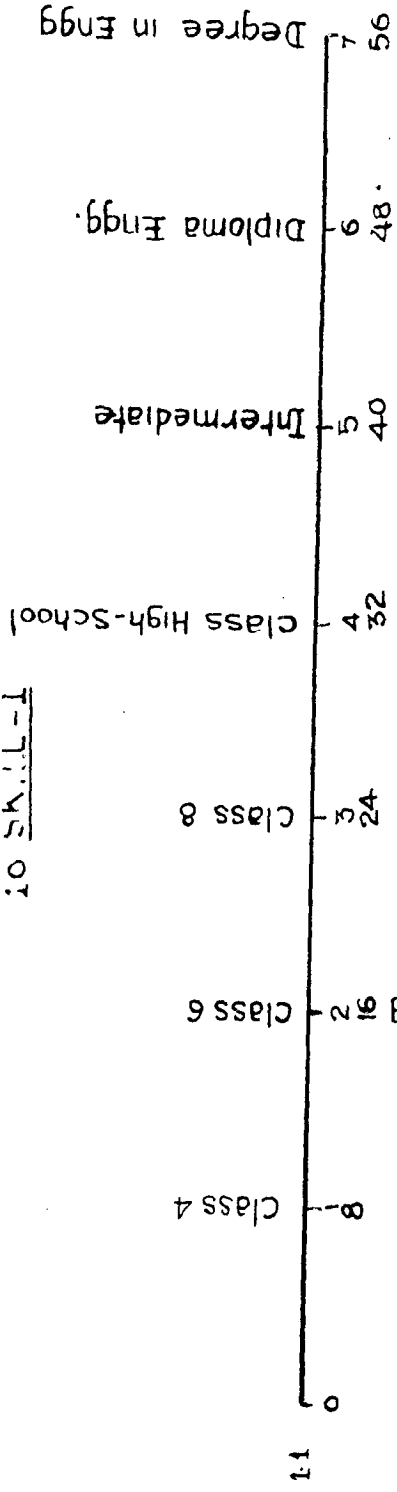
DEGREE VALVES OF PROPOSED PLAN

S.No.	FACTOR	DEGREE VALUE						
		1	2	3	4	5	6	7
1	Skill							
1.1	Education	8	16	24	32	40	48	56
1.2	Training	15	10	15	20	25	30	35
1.3	Experience	15	30	45	60	75	90	105
1.4	Analytical Ability	8	16	24	32	40	-	-
1.5	Mental skill	2	4	6	8	10	12	-
1.6	Manual skill	2	4	6	8	10	-	-
2.0	Responsibility							
2.1	Material or Product	5	10	15	20	25	30	-
2.2	Tool and Equipment	5	10	15	20	25	30	35
2.3	Work others	5	10	15	20	25	-	-
2.4	Safety others	5	10	15	20	25	30	-
2.5	Supervision	2	4	6	8	10	12	14
2.6	Independence	2	4	6	8	10	-	-
3.0	Efforts							
3.1	Physical	8	16	24	32	40	48	56
3.2	Mental or visual	8	16	24	32	40	48	56
4.0	Working Condition							
4.1	Hazards to self	8	16	24	32	40	48	56
4.2	Atmosphere	3	6	9	12	15	18	-
4.3	Temperature	3	6	9	12	-	-	-
4.4	contactor Noise	3	6	-	-	15	-	-
4.5	Glare or Dark	3	-	9	12	15	-	-

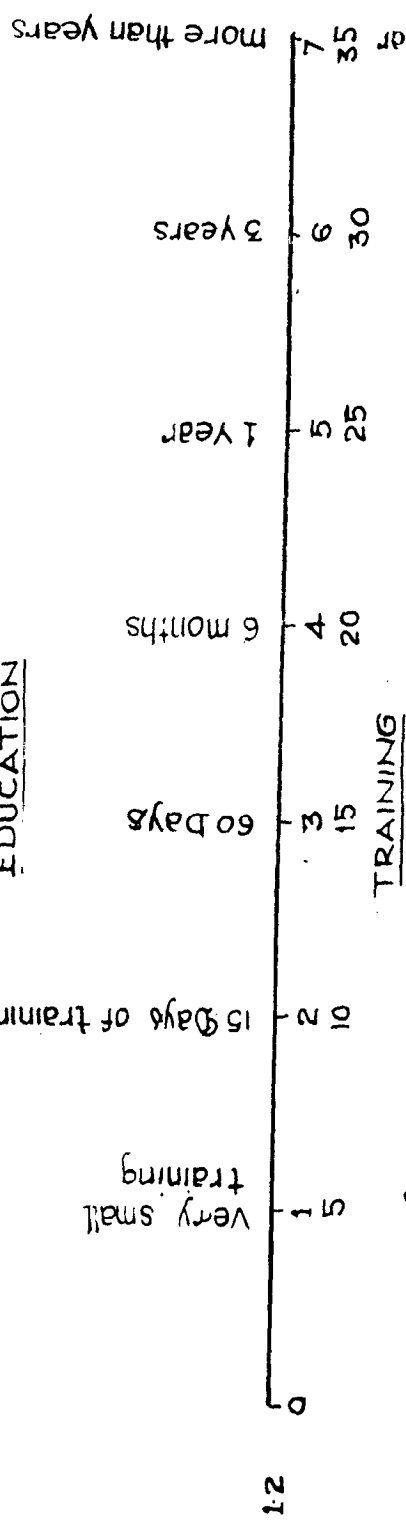
DEGREE VALVES

FIG NO. 2

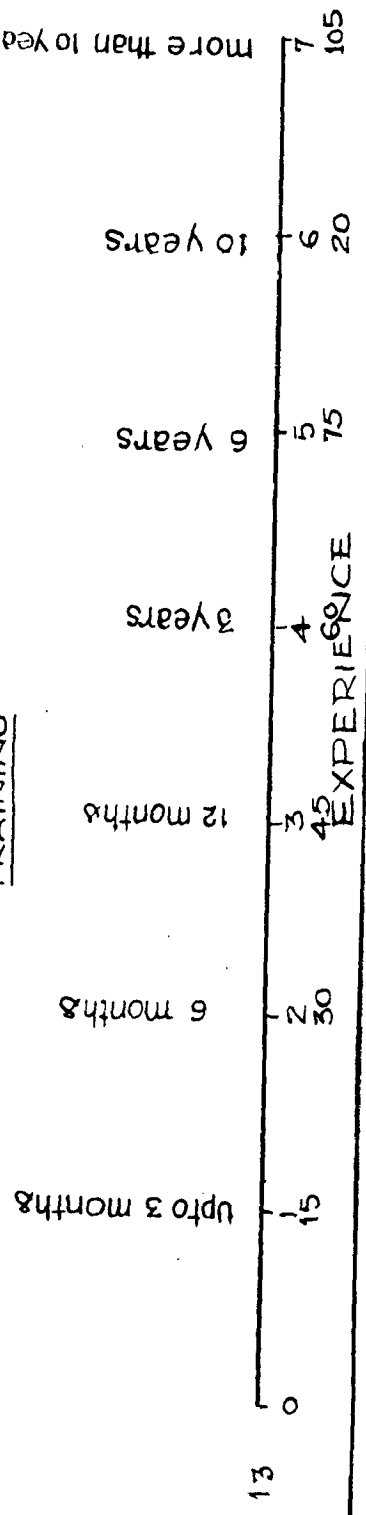
10 SKILL-1



EDUCATION



TRAINING

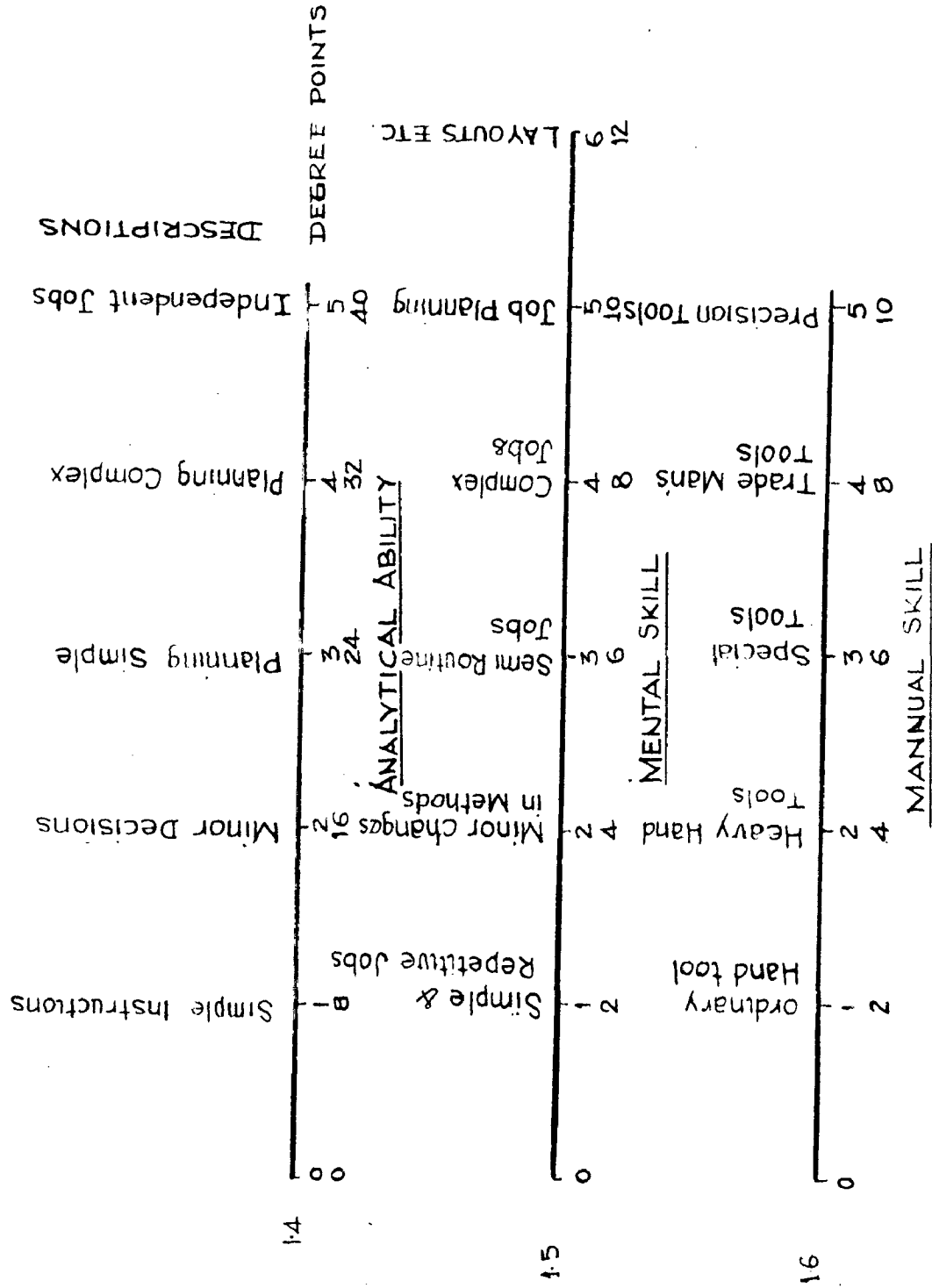


EXPERIENCE

DEGREE SCALES

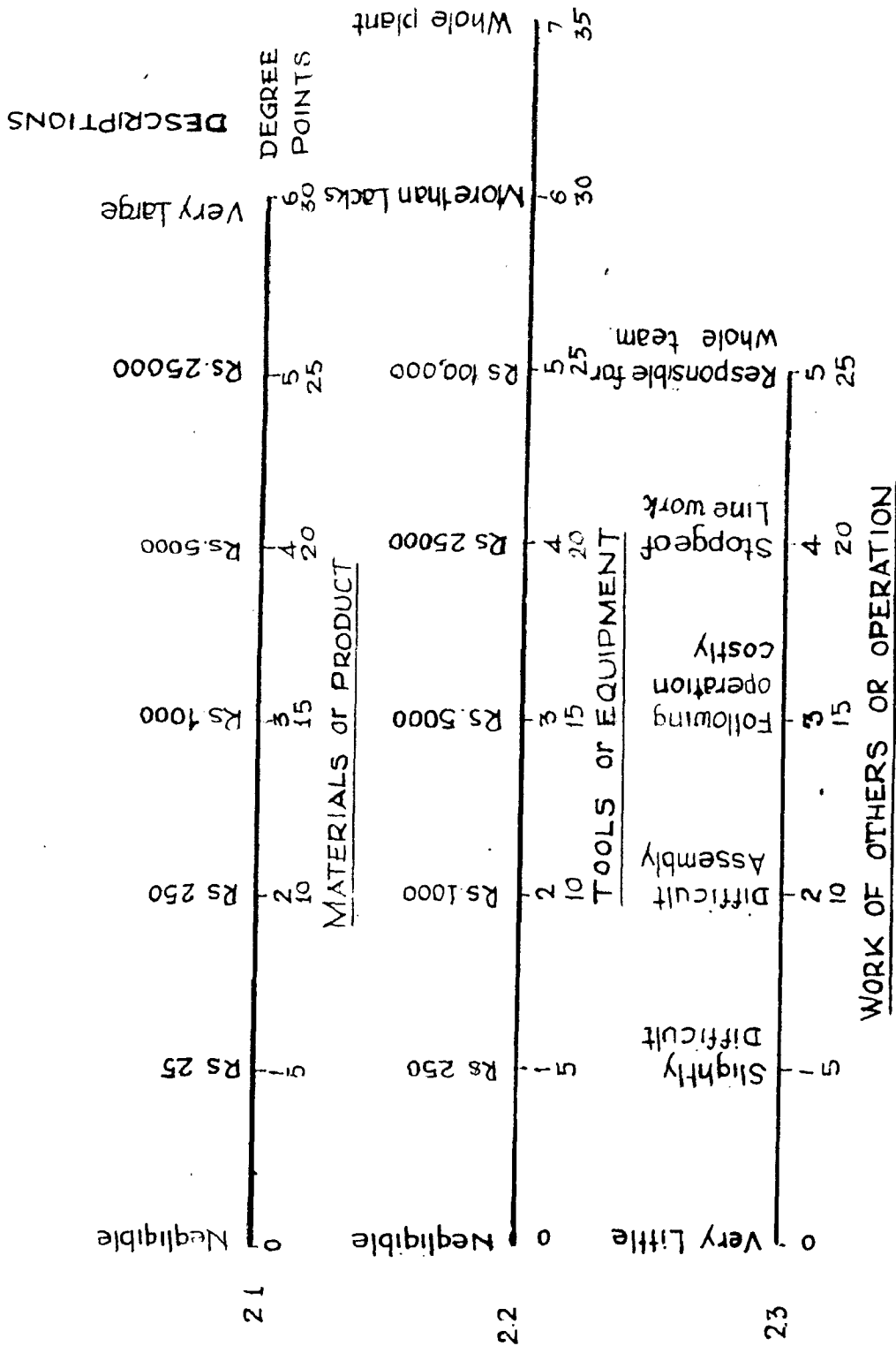
FIG. NO.

10 SKILL - II



DEGREE SCALE
FIG. NO 4

2 RESPONSIBILITY-I

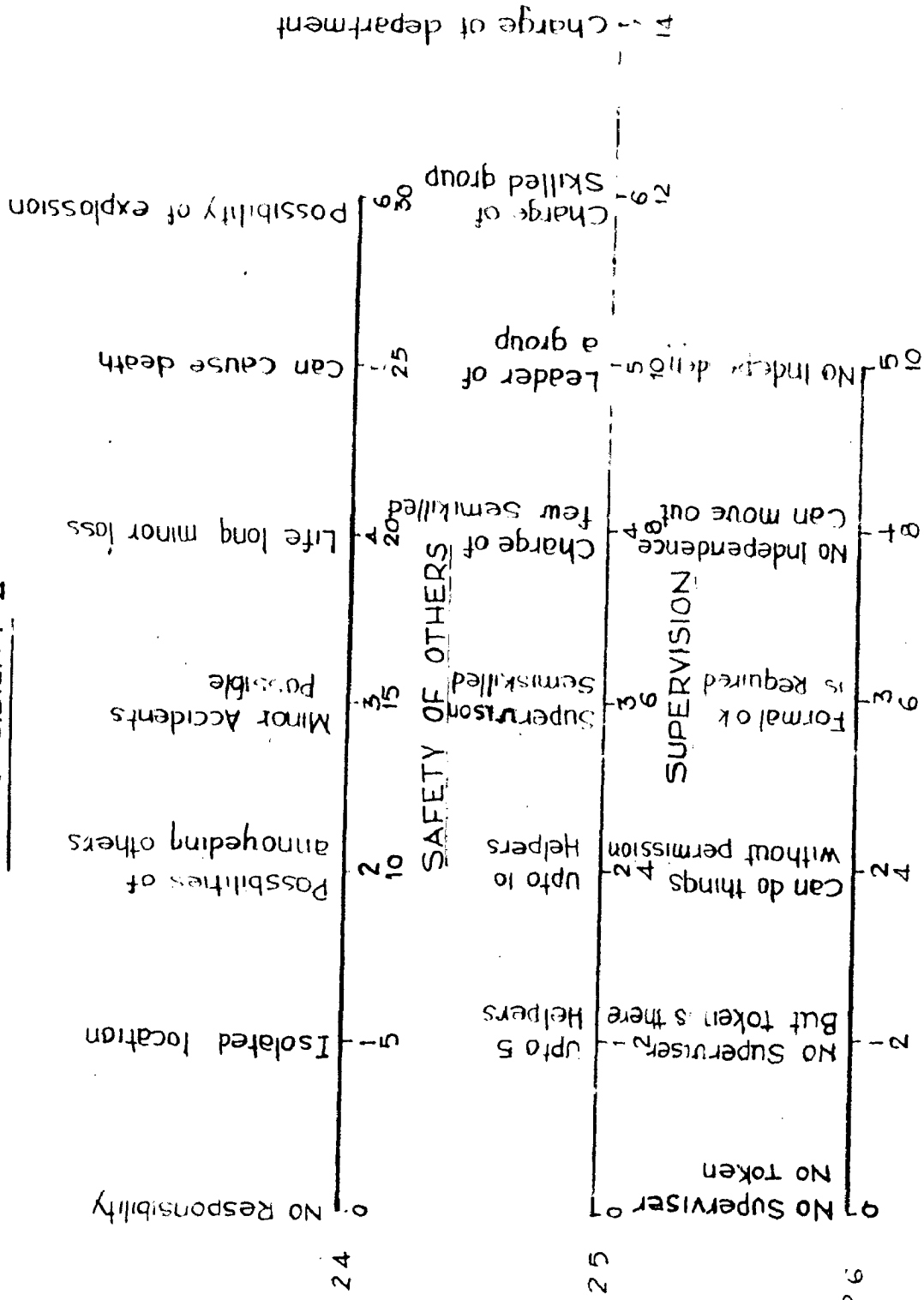


DEGREE SCALES

FIG No. - 5

100

2.0 RESPONSIBILITY II



Charge of department

Charge of Skilled group

Leader of a group

Charge of few Semiskilled

SAFETY OF OTHERS

Supervision Semiskilled

Upto 10 Helpers

Upto 5 Helpers

SUPERVISION

Formal or is Required

Can do things without permission

No Supervisor But token is there

INDEPENDENCE

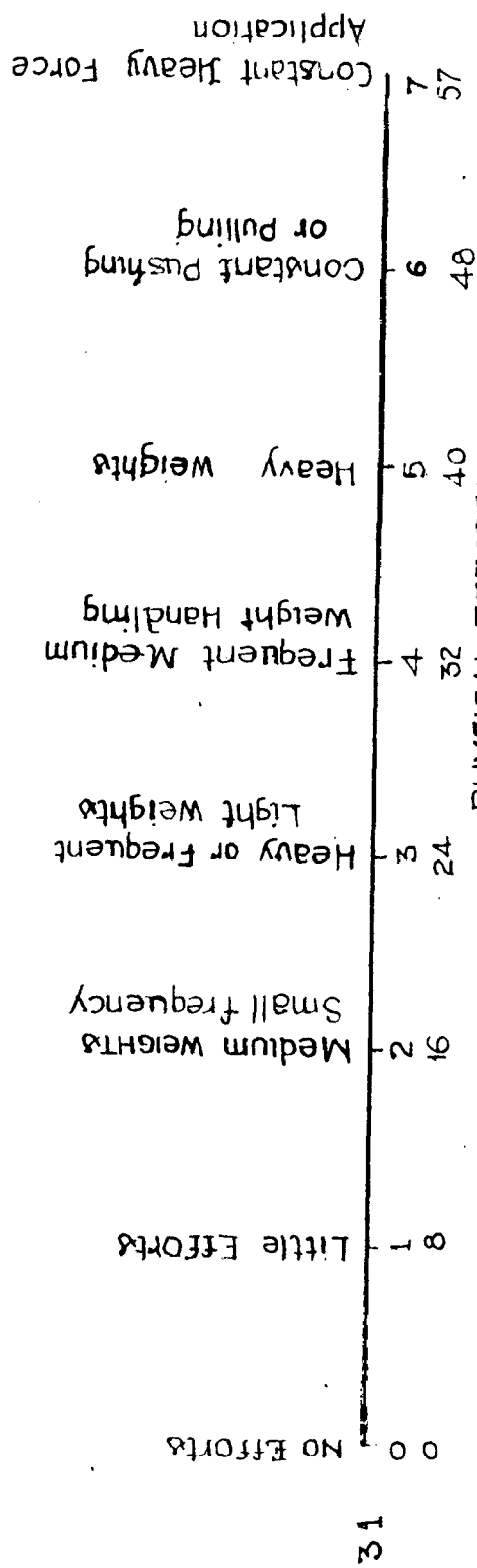
No Independent decision

No Independence Can move out

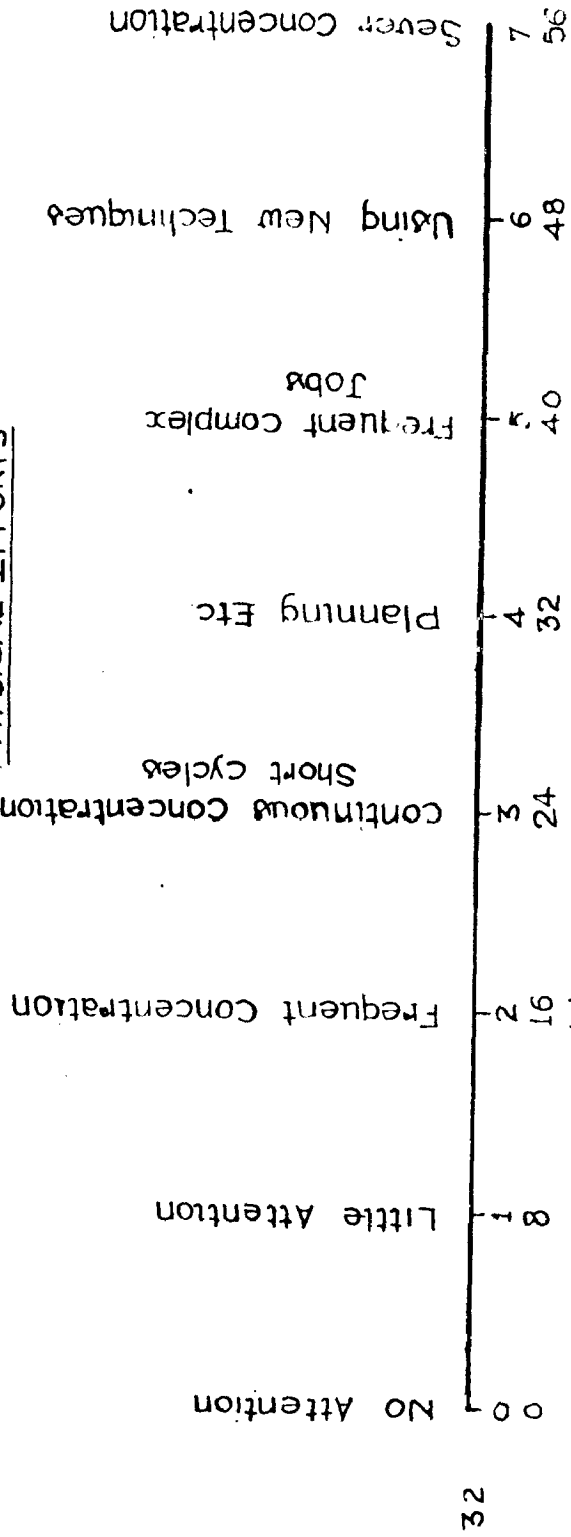
DEGREE SCALES

FIG NO - 6

30 EFFORTS



PHYSICAL EFFORTS

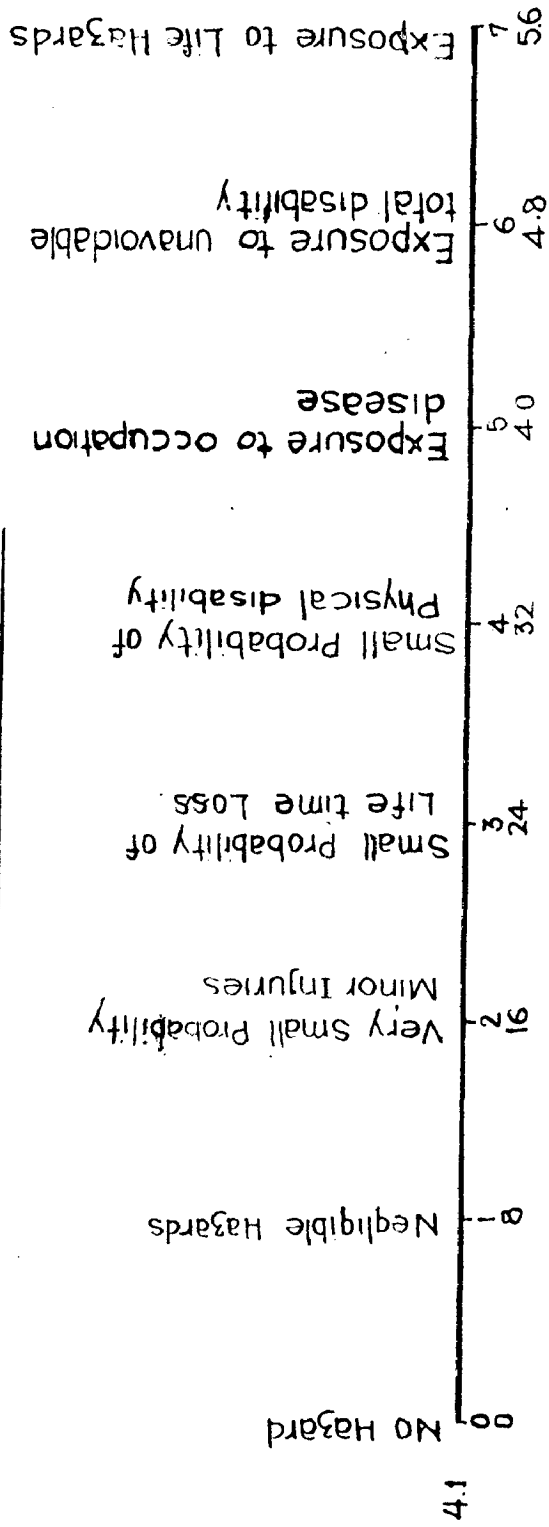


MENTAL EFFORTS

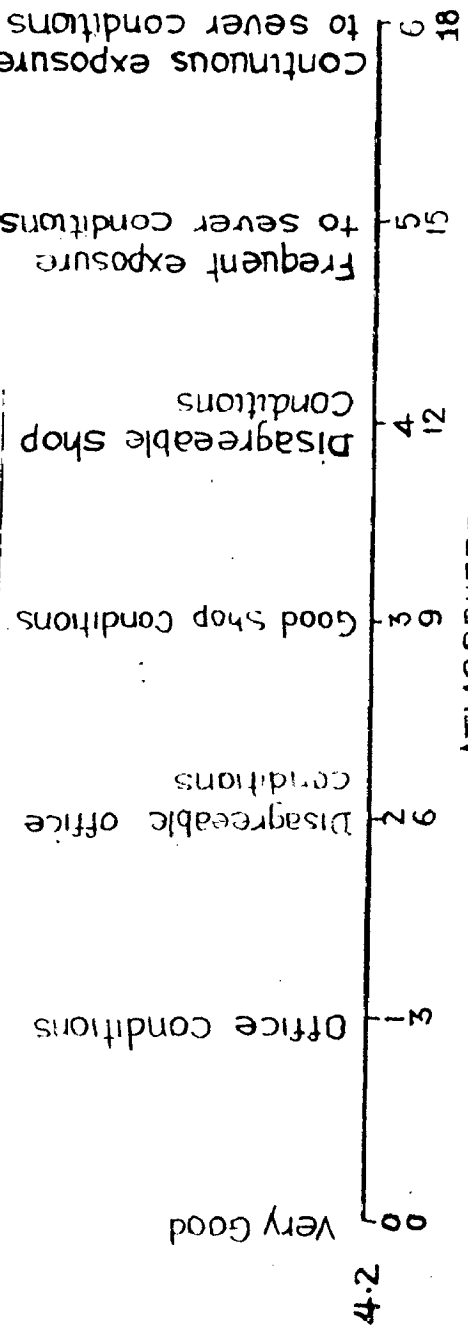
DEGREE SCALES

FIG NO 7

4.0 WORKING CONDITION-I



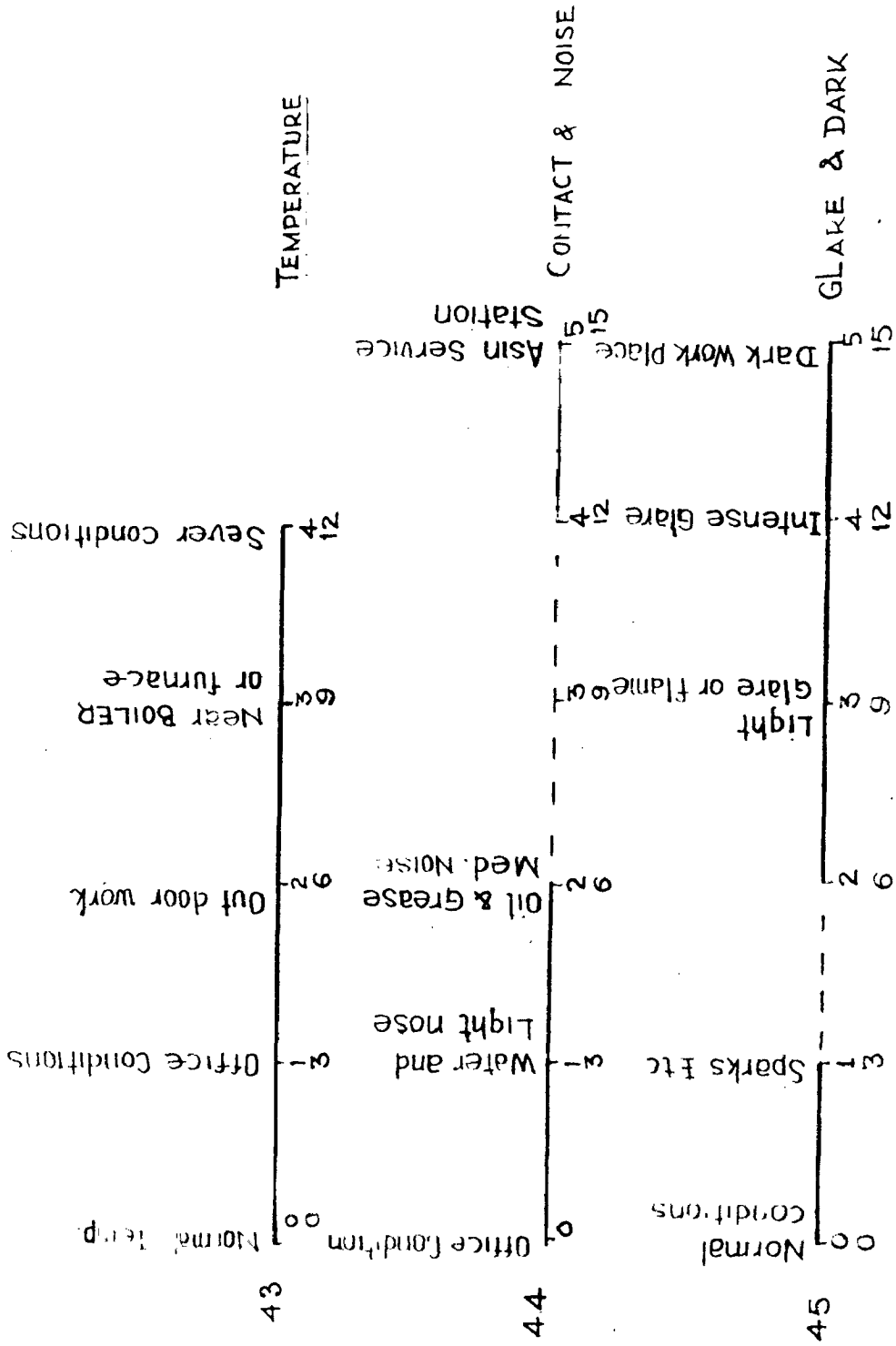
HAZARDS TO SELF



ATMOSPHERE

• DEGREE SCALES

4.0 WORKING CONDITIONS - II



DEGREE SCALES

FIG No-9