DOCUMENT RESUME

ED 095 411 CE 001 978

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TITLE Career Progression Systems in the Internal Labor Market for a Multi-Plant Manufacturing Corporation.
INSTITUTION Humanic Designs Corp., Manhasset, N.Y.
SPONS AGENCY Manpower Administration (DOL), Washington, D.C. Office of Research and Development.
REPORT NO DLMA-82-34-70-04-03
PUB DATE 12 Oct 73
NOTE 86p.; For related document, see CE 001 979

EDRS PRICE MF-$0.75 HC-$4.20 PLUS POSTAGE
DESCRIPTORS *Career Ladders; Collective Bargaining; *Cost Effectiveness; Data Analysis; Employer Employee Relationship; *Employment Opportunities; Industrial Relations; *Inplant Programs; Job Development; *Manpower Utilization; Promotion (Occupational); Systems Development; Work Life Expectancy
IDENTIFIERS *Career Progression Systems

ABSTRACT

The report describes the design of opportunity-expanding and equitable career progression systems for hourly paid industrial workers in two midwest plants, and the organizational (corporate, plant, union) barriers to changes in existing systems. These were shown to be restricting and often inequitable. The report concludes that theoretically sound progression models can be designed but that implementation of anything other than training and counseling calls for a different state of "readiness" than that found in the two plants. Most probably, the report states, this can only be achieved if the top corporate and International Union officials, jointly, work with plant and local union officials to change seniority clauses in the collective bargaining agreement and plant customary practice. The rationale for the work described in the report was that the design and introduction of career progression systems within a major multi-plant manufacturing corporation would provide high visibility for a successful project, providing insight into transferability of career progression designs from plant to plant and deal with problems fundamental to the effective utilization of the labor force in the United States. (Author/MW)

CAREER PROGRESSION SYSTEMS IN THE INTERNAL LABOR MARKET FOR A MULTI-PLANT MANUFACTURING CORPORATION

Interim Report

September 1972 - September 1973

This report was prepared for the Manpower Administration, U.S. Department of Labor under research and development contract #82-34-70-04. Since contractors conducting research and development projects under Government sponsorship are encouraged to express their own judgement freely, this report does not necessarily represent the official opinion or policy of the Department of Labor. The contractor is solely responsible for the contents of this report.

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October 9, 1973

1. REPORT DATA — 2. DL 82-34-70-04-03	
Career Progression Systems in the Internal Labor Market for a Multi-Plant Manufacturing Corporation	October 12, 1973
7. Leonard Smith	8. 03
9. Humanic Designs Corporation 1615 Northern Boulevard Manhasset, New York 11030	10. 11. DL 82-34-70-04
12. U.S. Department of Labor Manpower Administration Office of Research and Development 1921 20th St., N.W., Washington, D. C. 20210	13. Type of Report & Period Covered: Interim Report Sept.1972-Sept.1973 14.

15.

16. The report describes the design of opportunity-expanding and equitable career progression systems for hourly paid industrial workers in two midwest plants, and the organizational (corporate, plant, union) barriers to changes in existing systems. These were shown to be restricting and often inequitable. The report concludes that theoretically sound progression models can be designed but that implementation of anything other than training and counseling calls for a different state of "readiness" than that found in the two plants. Most probably, the report states, this can only be achieved if the top corporate and International Union officials, jointly, work with plant and local union officials to change seniority clauses in the collective bargaining agreement and plant customary practice. This will be attempted in the upcoming phase of the project.

17. Key Words and Document Analysis. 17a. Descriptors

Cost/Benefit Analysis
Counseling - vocational interests
Industrial training
Job analysis
Job description
Labor relations
Manpower utilization
Mobility
Skilled workers
Statistical analysis
Unskilled workers
Upgrading

17b. Identifiers, Open-Ended Terms

Midwest Corporation
Ohio Plant
Detroit Plant
Career Progression Systems
Institute

17c. COSATI Fields/Groups S - I 14 - A

18. Availability Statement: Distribution is unlimited. Available from National Technical Information Service, Springfield, Va. 22151.	19. Security Class (This Report) UNCLASSIFIED	21. 86
	20. Security Class (This Page) UNCLASSIFIED	22.

PREFACE

During the late 1960's, Humanic Designs Corporation (HDC) conducted a series of experimental and demonstration projects aimed at developing a model upgrade training system for low-skill, low-wage workers. This work focused on the "working poor", especially those who were seemingly locked into dead-end entry-level jobs. The design parameters for the model system included a short training period, guaranteed one-step promotion on completion of training, and a 15% increase in base pay for training graduates. HDC developed the High Intensity Training (HIT) model to fit these parameters and demonstration projects were carried out in New York City, Baltimore, Cleveland and Newark.[1/]

The model upgrade training system which emerged rested on two principal hypotheses. One suggested that one-step upgrading of dead-ended employees would serve to link these workers into the general upward mobility system of their firms.[2/] Thus, once on the upward track, a worker's future could be expected to be "bright". A corollary to this hypothesis was that these newly upgraded workers would retain their upward momentum if they left their firms (or industries) and re-entered the external labor market. Underlying the hypothesis and its corollary was an implicit belief that upward mobility generally existed in American industry at the time, and that certain workers were dead-ended as a result of discrimination, comparative educational disadvantage, or simple bad luck. HDC reasoned that one-shot intervention would help to overcome these systemic aberations, and that the basic structure of the typical internal labor market was generally supportive of upgrading.

A second principal hypothesis suggested that upward movement out of entry-level jobs would open these entry slots to the hardcore unemployed. A corollary to this was the understanding that these newly installed workers could themselves be upgraded through HIT programs into more meaningful jobs above entry level. At the time this seemed like a reasonable scenario, given general economic conditions, the need to remedy skill shortages and the increasingly clear effects of race (and sex) discrimination.

Two particularly important lessons were learned during the course of these HIT modeling efforts.[3/] First, HIT trainees tended to

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1/ A full account of this work can be found in a four-volume report, Upgrading the Underemployed in the Work Environment, Skill Achievement Institute, 1969.

2/ If one subscribes to the Brecher thesis of intra-industry mobility rather than intra-firm, then this hypothesis may still be said to hold true, but for the larger demand universe. See Charles Brecher, Upgrading Blue Collar and Service Workers, Baltimore, 1972, (especially Chapters 1 and 7).

3/ For a fuller report on these efforts, see Upgrading the Underemployed in the Work Environment, Skill Achievement Institute, 1969; and Follow-Up Analytic Study of a Three City Upgrading Program, Skill Achievement Institute, June 1971.

become dead-ended in their new (higher) job slots, and to assume entry-level status upon re-entering the external labor market. Second, there was no evidence of one-to-one hiring of new employees to fill entry-level positions vacated by upward moving HIT trainees.4/

There were some direct benefits from the HIT experiments. All trainees were promoted at least once (if not permanently) and some moved rapidly into supervisory positions. Additionally, host managements were favorably impressed with the potential utility of HIT-style intervention in their firms. The most profound result of the HIT ventures, however, was the realization that the original expectations held for HIT were unrealistic, and that the host firms had structural problems - namely, inefficient and inequitable manpower development and utilization "systems". More particularly, promotion and transfer practices were frequently haphazard and burdened by rules which purposefully excluded capable employees from job movement within the firm.5/ Second-level jobs became, in effect, the new entry-level, and most workers were again dead-ended (at a higher salary).6/ Once released to the external labor market the HIT trainees still lacked formal credentials, and were continued victims of discriminatory hiring and promotion patterns.7/

These findings stimulated the development of the concept of "rational career progression systems". It was reasoned that by suitably modifying the ways in which employees were promoted or transferred from entry levels through the first levels of management, the structural causes of dead-ending could be remedied.

While the exact forms of such career progression systems were not immediately evident, it was clear that they would include, at the very least, the following:

- firm-specific or industry-specific career ladders, linking jobs into progression sequences on the basis of skill and knowledge relationships;
- inter-departmental transfer paths;
- formal training and counseling institutionalized as a part of the career progression system;
- promotion and transfer criteria which combined relevant previous job performance records, satisfactory completion of training exercises, and seniority.

4/ The reader may recognize the similarity between the expectations of new entry-level hiring and the so-called "filter-down" theory of the housing market. In both cases, movement of people out of one level of job or housing did not lead inexorably to improved job or housing status for people more impoverished than the beneficiaries of the remedial intervention.

5/ For example, academic or experiential requirements for jobs were often overstated, or transfers and promotions were confined to intra-departmental moves despite the logic of inter-departmental job linkages.

6/ Thus, no new job slots were opened for unemployed people.

7/ All the work of this phase is described in Status Report - Upgrading the Underemployed in the Plant Environment: September 1, 1969 - February 28, 1971. See also Follow-Up Analytic Study of a Three-City Upgrading Program, op. cit.

The target population for career progression systems went beyond the "working poor" as originally defined for the HIT work. In order to benefit this group, it was contended, attention had to be paid to workers at higher job levels.

Work commencing in 1969 was directed toward (a) post-intervention analysis of HIT, (b) exploration of promotional systems in general and (c) the possibilities of improved design of such systems.

As a result of this work, HDC proposed to the U.S. Department of Labor, Manpower Administration, the design and introduction of career progression systems within a major multi-plant manufacturing corporation. The rationale for the work described in this report was that such a corporation would provide high visibility for a successful project, provide insight into transferability of career progression designs from plant to plant and deal with problems fundamental to the effective utilization of the labor force in the United States. In particular, a large manufacturing corporation would be an employer of large numbers of minorities and women and have "new work force" problems which improved career progression opportunities might significantly address.

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CHAPTER 1

OVERVIEW

OVERVIEW

Humanic Designs Corporation (HDC) under contract to the U.S. Department of Labor, Manpower Administration, proposed the design and introduction of rational career progression systems within a major manufacturing corporation.

It is important to note that the concept of the rational career progression system is significantly different from earlier concepts of upgrading and upgrade training. The career progression system deals with the movement of people through all or major segments of the jobs and positions within an organization, as well as with the associated policies, procedures, practices and mechanisms. Upgrading, on the other hand, tends to focus upon facilitating the movement of employees one step upward rather than into broad channels of career progression.

A career progression system may embrace such familiar manpower concepts as upgrading, high intensity training, counseling, etc., but it exceeds all of these programs in its aim of linking them into a dynamic unit.

As defined for the purpose of the contract, a career progression system consists of all of those things associated with opportunities for employees to increase their skills, productivity, responsibility and income within their employing organizations. Major elements include:

- policies, procedures and practices - both formal and informal - governing who qualifies for advancement and promotion, when and the manner of their selection;
- the mechanism through which employees attain a status qualifying them as promotional candidates;
- the job structure, or how jobs are connected in sequence from lower to higher.

All organizations have some sort of career progression system; some are effective, some are not.

Broad Research Questions

The R&D project described in this report was designed to answer three broad research questions: 1) What are the inhibitors and the facilitators of designing and implementing career progression systems, or changing existing practices, within a multi-plant manufacturing organization? 2) What are the effects on an organization and its work force of a system based on skill/knowledge related progression lines as well as seniority? 3) What are the most appropriate guidelines for employers who wish to design and implement more equitable and rational progression systems?

Project Goals

In order to respond to the research questions posed, the following goals were established. To:

1. make explicit, in a multi-plant manufacturing corporation, its present promotional system and the promotional patterns that result;

2. assess the "rationale for development of a company-specific career progression system" for the multi-plant manufacturing corporation;

3. design such a system;

4. extend the company-specific system to a generalizable model, applicable to other similar plants both within and outside the corporation;

5. implement the company-specific system and evaluate its impact on the movement, behavior and productivity of labor inside the firm;

6. analyze those aspects of "organizational climate" which influence the firm's decision to embrace or reject the concept of career progression and the company-specific design.

Site of R&D Activities

To serve as the site for the R&D activities, HDC selected a multi-plant manufacturing organization based in the Midwest

(hereinafter referred to as the Midwest Corporation) which agreed to serve as "host" to the project.

The Midwest Corporation is one of four principal firms in its industry, and thus a significant force in the determination of industry-wide policies with respect to production factors, union agreements, and the like. It is a publicly-held stock corporation. While Midwest Corporation produces many consumer durable goods, the preponderance of its efforts are directed toward the manufacture of a line of goods which the consuming public readily associates with the corporation's name.

One union represents production maintenance and clerical workers within this giant industry. Any activity which might touch on the territory of the union, or which could conceivably command the attention of this corporation's three major competitors is of major significance to corporate decision makers. Career progression systems are one such activity.

The HDC liaison within the host corporation was its training and education group, hereinafter referred to as the Institute. It was expected that the Institute would cooperate with HDC's efforts eventually to acquire technical abilities in the application of system design tools and techniques. Two experimental sites were chosen, the "Ohio Plant" and the "Detroit Plant".

What Was Accomplished

At each plant site, HDC and the Institute staff: (a) collected and analyzed data on the in-plant movements of the work force; (b) developed prototype first approximations of a career progression system for limited sections of each plant; (c) performed Job Task and Requirements Analyses (JTRA's) on the universe of jobs included within the prototype career progression system; (d) designed a career progression system and recommended alternative operating procedures, meeting the specific needs of each host plant's target departments; and (e) initiated implementation and evaluation of a limited pilot version of the recommended system in the two plants.

As can be seen from the above listing of activities, all the operational goals were achieved - short of the crucial goal

for implementation of a complete design. The career progression systems designed were accepted as theoretically valid but implementation and evaluation were restricted to selected components of the design, namely training and very limited use of inter-departmental mobility. A description of present promotional patterns and the recommended career progression systems for the Ohio and Detroit Plants can be found in Chapters 3 and 4.

One of the research questions - the effects on an organization and its work force of the proposed system - can not as yet be answered. Hence, future activities should continue to address the question of facilitators of implementation. On the other hand, HDC has learned a great deal about the research question concerning inhibitors of implementation of career progression systems. The reasons for limited and selective implementation are treated separately in Chapter 2, "Organizational Readiness for Career Progression Systems."

Summary of Findings and General Recommendations

Before describing, in summary, what general learnings have emerged to date, we should point out one specific circumstance that inhibited acceptance of change, namely the impending expiry of the collective bargaining agreement between the corporation and the production and maintenance workers. This created a kind of leitmotif, which accompanied the final six to twelve months of the project period. As the negotiations neared, the willingness of management to entertain precedent-setting variations in personnel practices was progressively reduced and their ability even to discuss such variations with the union local was constrained by corporate fiat. Thus, for all practical purposes, a delay of perhaps three months or more was created precisely at the point where implementation decisions were required from plant management.

It should also be borne in mind, when interpreting findings from the project to date, that it was itself part of a larger, ongoing effort within Midwest Corporation to overhaul gradually the corporation's practices with respect to development and management of labor resources, with emphasis on upgrading strategies. To judge the career progression system efforts independent of these other efforts overlooks the integral nature of the career progression system in the eyes of the host Plants and Corporation and Institute staffs.

With these provisos, it is still useful to summarize the things we think are generalizable findings and recommendations, even though they are based on two case studies (i.e., work in two plants) of an ongoing project:

1. The wage structure of production and maintenance workers in a plant using mass production technology is very condensed, reflecting the effects of Taylorism. Skill and knowledge increments between jobs are small since skill and knowledge requirements at almost all levels are themselves small. Rational career progression can only be achieved if equal opportunity is provided for all hourly employees to move into the skilled trades, the skilled clerical, technical and engineering jobs, or into management. This implies a dissolution of present barriers between departments and areas of work (i.e., production and maintenance, clerical, technical, engineering).

2. Progression "models" can be designed, using the current approach, which find acceptance as theoretically valid systems, at many organizational levels (i.e., in the present case at the Institute and plant management levels).

3. A strategy for "institutionalizing" these models that relies predominantly on a "ground swell" from one plant to another and finally to all is inadequate. The prime reason for this inadequacy is the anxiety of plant level officials (management or union) about introducing any changes that disturb the delicate balance of the collective bargaining agreement and customary plant practice with respect to promotion and transfer. Management fears loss of the prerogative of "labor control", perceived as a consequence of encouraging promotion across departmental boundaries; the local Union officials fear loss of the employees' prerogative of promotion based on seniority alone, perceived as a consequence of promoting through particular sequences of jobs.

   While these are not new findings in the field of organizational behavior, they are stated to explain why the ground swell approach cannot be

solely relied upon to obtain institutionalization of a theoretically accepted progression system.

4. With such concerns present, plant staff tends to fragment a career progression system and select what is least controversial from it; namely, formal training and/or counseling. Implementation of these components is not sufficiently innovative to generate any real excitement among plant management and there is, therefore, no significant ground swell.

5. There seems to be a need for a policy respecting career progression throughout the corporation which emanates from the highest corporate level, is consonant with International Union policy and is designed to encourage plant level officials to implement innovative career progression systems. This means, in effect, the initiation of a dialogue between plant management, local Union officials, corporate management and International Union officials to give life and authority to such policy.

   Without authoritative support, plant level officials (management or union) will probably not be able to overcome their anxieties and create any meaningful changes in the plants.

6. The industry in which the R&D work was carried out is moving, albeit slowly, to a recognition that blue-collar workers are demanding more pleasant, safer and healthier working conditions, more "sympathetic" supervision, equitable promotion and hiring practices regardless of race or sex, as well as higher wages. The Midwest Corporation provides a case study of how corporate policy may be formed to integrate these matters.

   The R&D project sees its role as that of a catalyst, hastening the process of corporate realization of the need to construct and operationalize a new policy of human resource utilization within the firm. This policy should relate,

among other things, career progression systems with the concerns for equal employment opportunity; and the training component of career progression with orientation to occupational safety and health.

In the next phase of activities, HDC and the Institute will, hopefully, expedite the dialogue with management and help shape such a policy, at least as it concerns innovative career progression opportunities. Concomitantly, this is expected to generate the willingness of plant and local union officials to take some modest risks.

CHAPTER 2

ORGANIZATIONAL READINESS FOR CAREER PROGRESSION SYSTEMS

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It may be helpful in discussing organizational readiness to participate in the R&D project, first to describe the broad industrial setting, and then to discuss the rationale presented for involvement of the corporation in the development of rational career progression systems. This section will also discuss how the plant sites within the organization were selected and the rationale used with plant management.

Industrial Setting

The Midwest Corporation is the third-ranking member of its industry among American-based multinational producers of an important consumer durable product. The corporation ranks high on the Fortune 500 list of manufacturers.

The Midwest Corporation's production sites are very large factories, including forging, machining, stamping and assembly. In numerous instances plants within the industry have been the focus of social and public policy concern for the "quality of life" of the blue-collar worker.

In most of the Midwest Corporation plants, the heat can be oppressive, the noise deafening; working conditions appear hazardous; and the sheer scale of the plant is humbling. The plant seems to have its own pace and momentum which is independent of the work processes which are performed by the labor force. While the common wisdom can be challenged by both labor and management, the immediate impression is that workers must have a strong back and an uncreative mind to perform their duties.[8/] Taylorism has been elevated to a high art in this industry, resulting in unprecedented gains in output over the decades since the end of World War II.

8/ Many workers, particularly women in assembly-type operations, have become so accustomed to their work that their eyes and minds read books while their hands blindly assemble brake drums.

Most workers can be easily replaced, due in part to the low company investment in skills training, itself a consequence of the application of Taylorism. Some industry and Midwest statistics may provide the reader with a sense of the dimensions of the work setting.

- The Midwest Corporation has over 20 plants in the greater Detroit area, plus many others scattered throughout the United States (and abroad).

- In 1970, the average weekly blue-collar wage at one of Midwest Corporation's competitors was $185.00, putting this "average worker" in the top third of the American income spectrum for that year.

- The average worker at one Midwest plant has worked a six-day, 54 hour week during the past year. The 40 hour week is a rarity. In four departments at the same plant, workers have been working an average of 63 hours a week (7 days) since 1967. Not withstanding the occasional fourth Sunday off, the accident, illness, scrap, absenteeism and tardiness rates have been rising steadily in these departments.

- Annually, the Midwest Corporation hires over 10,000 workers at entry-level jobs simply to keep pace with expansion and turnover. It employs over 100,000 workers nationally in entry-level jobs alone.

- The industry is increasingly aware of the youthfulness of its work force. Among the ranks of production workers, over 50% are thirty years of age or younger. Of these under-30 workers, very few are expected to remain with the company until retirement.

- Currently, over one in four Corporation employees belongs to a minority group, while ten years ago there were one in eight. In some plants the minority group participation rates in production jobs exceeded 70% of the total.

Against this brief background to the industry, some conclusions may be formed.

To the extent that absence of mobility opportunities is a problem within the industry (and as can be seen from findings in Chapter 3, within the host corporation) it is a problem which is linked to such other issues as work force demography, job content and production technology, working conditions, foreign competition in domestic markets and local union militancy which propels the International to broaden negotiating demands into formerly taboo areas.

The industry's principal production-level problems of turnover, absenteeism and poor workmanship derive from a combination of labor force problems, some of which go well beyond the impact of the most extensive restructuring of the internal mobility structure or the rationalization and modernization of promotion and transfer procedures.

The nature of the production process - capital intensive, mass production format, not susceptible of complete automation, etc. - often constrains the innovator from intervening in the man-machine relationship, and most likely limits organizational changes to incremental ones.

The Corporate Organization

HDC's "vehicle" for introducing the career progression concept into the Midwest Corporation was the Institute, which represented the Corporation (as distinct from the plants) only to the extent that it was established as the Corporation's training arm and had been given approval by the Corporation's Vice President for Personnel to become involved in the project. It is unclear to what extent the Personnel Department or any other Corporate or Divisional departments understood what the project's goals or objectives were and how these might impact the policies and practices of the Corporation. Contact between HDC and Corporate or Divisional personnel has been minimal, because of the "low profile" posture favored by the Institute. It is necessary to commence with a caveat that HDC does not know, directly, what the Corporation or the Divisions were ready to accept, or what their concerns were or are. Evidence in this respect is inferential, based on the Institute's involvement in efforts such as JOBS, pre-apprenticeship and "upgrader" programs.

Subject to this caveat, it would seem that at the Corporate/Divisional level there was and is a readiness to work toward improving the employment opportunities of minorities. The

career progression concept, as presented to the Institute (and, presumably, as presented by the Institute to the Corporate Vice President for Personnel) did not stress this theme; it was one among many. However, there was apparent psychological readiness to perceive of increased career opportunities for hourly workers as a gain for minorities. What was not heard, it would seem - and perhaps there was no readiness to hear - was the contrapuntal theme of enlarged seniority domains.

Readiness to hear, and to some extent act on, the theme of improved employment opportunities for minorities is easily understood. As described earlier, the Corporation has a very large part of its production based in the inner city of Detroit and its production and maintenance work force is predominantly black. The Detroit plants had and continue to have strikes, sabotage, violence and absenteeism. Black militancy runs high and addresses itself among other things to a sometimes draconian disciplinary system operated by predominantly white supervisors. In this climate, top management can be expected to be willing to try anything that will offer blacks more visible equity in promotional opportunities and legitimately improve their representation in the higher paying production and maintenance skilled trades jobs and the foremen ranks.

The plant that the Institute selected for the initial R&D involvement was a Detroit machining plant having all these problems and a large JOBS program that was something of a revolving door. It typified why the Corporation was interested in career progression systems.

It is interesting to speculate what would have been the history of the project if the theme of enlarged seniority domains had been made so insistent that it could not have been ignored. It is possible that Corporate management would have been unwilling to trade-off what they may well have perceived as reduced labor control (a key management prerogative) against increased progression opportunities for minorities. Certainly any willingness in this direction could only have been operationalized by involving the International Union, and the plant and local union levels, since the collective bargaining agreements would have to be modified. This then raises the issue of whether the Union would have accepted the concomitant trade-off they would have to make, namely

the acceptance of a definition[9/] of "ability" other than performance on the job after promotion.

These are crucial issues. The Institute's view is that raising them in the first phase of the project would have destroyed it, because neither Corporate/Divisional management or the Union were ready for such changes. Hence the "ground swell" strategy. This strategy consisted of attempting to finesse career progression systems into individual plants and by so doing create a ground swell of favorable opinion among plant management. As other managers saw the favorable results of the system, so went the theory, they would request the Institute to help them install similar systems in their plants, until in time Corporate management had to take notice and eventually "institutionalize" the system as part of Corporate personnel policy and practice.

This strategy assured that individual plants would implement, if not complete systems, at least key elements thereof, so that there would be something innovative to demonstrate. The weakness was that, as will be explained in the next section, the plants accepted comparatively minor components of the system, so that any ground swell phenomenon was doomed to be of minor significance.

In the next phase, therefore, it would seem that the issues of labor control, interdepartmental transfer and seniority, which have not been confronted directly so far will have to be dealt with at Corporate and International Union level. The answers to whether a large manufacturing corporation is ready to move toward an improved system of promotion for its hourly paid workers depends largely upon whether it - and the related union - are willing to be somewhat flexible with respect to the seniority domain and the criteria of "ability". The fact that in the recently signed collective bargaining agreement, management has been willing to give up some of its cherished prerogatives respecting labor control, suggests that a new climate exists for just such flexibility, at least on management's part.

Without this flexibility, as HDC has learned from its experience in the two machining plants in which work has so

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9/ The definition being occupancy of a job in a job family, based on related skills and knowledge, which defines the enlarged seniority domain.

far been conducted, there is little that can be achieved in the way of changing the existing system. And it does not seem likely that plant management and local unions, unsupported and uninfluenced by Corporate management and the International Union will exhibit such flexibility. The organizational climate of the two Plants in which work was conducted, described below, is the basis for this conclusion.

The Plant Organization

HDC designed career progression systems in the Detroit and Ohio Machining Plants. 10/ Neither Plant has, to date, implemented the designs as originally conceptualized, although management of both Plants agreed as to their theoretical soundness if other things were equal; "other things" being management's perceived prerogatives of labor control and the Union's perceived prerogatives of defining ability to perform as ability demonstrated on the job after promotion.

On the other hand, both Plants were and are ready to do something in the area of improving promotional opportunities. The explication of their present promotional policies and practices as described in Chapter 3, proved to be a contributing factor in creating this Plant willingness. The Ohio Plant had a major problem of low productivity, which it equated in part, with a lack of training of its employees. There was also a concern with promotion of JOBS graduates, although this was the lesser of the two concerns. These two factors created the climate of readiness in the Plant.

At the Detroit Plant, although productivity was a major problem, its solution was seen not so much in terms of increasing skills by training as by improving morale by offering seemingly better promotional opportunities. The Institute had set the scene by its work in that Plant with respect to pre-apprenticeship training offered to educationally disadvantaged blacks. The proposed work was perceived as a natural extension of this. If the line for apprenticeship was too long, an alternative route to the non-apprenticeable skilled trades via production and maintenance jobs could perhaps be offered and so take off some of the heat.

10/ See Chapter 4 which describes these systems.

However, when concrete proposals for improving career progression opportunities were made to the Plants, it became clear that willingness to make major changes in the existing procedures was lacking. These procedures were:

> The collective bargaining agreements specify selection for promotion according to plant seniority, applied within a department. Movement between departments is inhibited by the agreement, which permits transfers only when the vacancy has been offered to every employee in a department and no one has accepted it. Typically, therefore, a transferee has to start at the lowest pay rate in a department, since this is the vacancy remaining when one employee has been promoted one step up at each level, up to the original vacancy level.
>
> While it may only be a short time before the transferee can exercise his plant seniority in order to gain a desired promotion, he is taking a risk of remaining at a low wage for quite a while.
>
> The agreement also says that ability as well as seniority has to be considered for promotion, but ability is not defined. To the Union it means ability to perform at the job once promoted. The Union (at the local level we encountered) was completely opposed to any other definition including that of previous job experience.[11/]

In the Ohio Plant, there was considerable use of an informal system of promotion. It appears that there was some encouragement given to employees to apply for transfer and efforts were made to meet their wishes. In this climate, the Plant management was willing to go some way towards a change in its formal system but relied upon extending its informal system in order to achieve this. With a change in the Personnel Manager at the beginning of 1973, the climate changed to some extent - a change that was aided by the increasing nearness of management-union negotiations for a new three year contract. The new climate was one of caution and a determination to stay with the letter of the collective bargaining agreement and Corporate policy regarding labor control.

11/ Highlights from the collective bargaining agreement will be found in Appendix A.

At the Detroit Plant, there was no prior history of encouragement of departmental transfer, and the climate was, from the beginning of the involvement, unfavorable to such a development. As with the Ohio Plant, the nearness of union negotiations reinforced a determination to adhere to the collective bargaining agreement.

HDC and the Institute (naively as it seems now) believed for some time that the logic of the designs would be sufficiently compelling to generate a willingness among Plant and Union management to experiment with them. However, we underestimated the overriding strength of the anxieties respecting: a) the actual loss of labor control ensuing from a change in seniority domain; b) the possibilities of Corporate disapproval; c) on the part of the local, the possibilities of union membership discontent at a change in the ability criterion.

The training component became the one "safe" aspect for both Plant and Local management. It was this which the Ohio Plant has put into operation (albeit only in two departments). It is this, plus career counseling, which the Detroit Plant proposes to put into operation, in one division of the Plant.

Such fragmentation of the design is of limited value to employees or employer. Although the training curricula were based on the job analysis and although training is a necessary component of the design, it does not constitute the key element of a rational career progression system. Only by providing paths between jobs of similar skill and knowledge requirements, cutting across departmental boundaries, can employee progression opportunities be enlarged. One of the goals of the next phase is to find ways of overcoming the anxieties previously mentioned, so that something closer to a rational and equitable system can be implemented and tested.

The strategy that will be attempted will be based on the following tentative learnings from the past work:

(1) While a ground swell from the bottom up is most necessary, it is not sufficient. Top management, including the top labor relations people, and the International Union leadership, must be persuaded to take leadership roles. In this way, anxieties of less senior people may be assuaged.

(2) The problems that the Corporation, the Plants and the Union perceive to exist with respect to manpower utilization and performance should be brought out in an explicit form and compared with the benefit to be anticipated from a rational and equitable career progression system. It is important that a career progression system should not be seen as a panacea for all manpower ills, and that it should be seen in the perspective of the total personnel process.

(3) Possibilities of conflict between recommended promotional procedures on the one hand and the collective bargaining agreement and customary procedures on the other, should be fully aired. At the same time, the potential benefits to all parties of exercising seniority within the domain of a skill-knowledge job family rather than a department, should be stressed. This way of looking at the consequences of the type of design favored by HDC has not been presented adequately in the past.

In more general terms, we see that the industry in which the study has been conducted, and particularly the Corporation itself, is moving to a realization that workers need more agreeable, safer and healthier working conditions, and more obviously equitable hiring and promotion practices, as well as higher wages.

However, although the Corporation is more ready than it used to be, to re-think its personnel policies and procedures, it has not yet enunciated a policy which would encourage officials at the plant level to try some modest experiments in the area of promotional policies or practices. It is our belieft that such encouragement is essential if there is to be any significant ground swell. It follows, therefore, that HDC and the Institute should try to initiate a dialogue within the Corporation, at all levels, and between the Corporation and the Union, regarding manpower policy in general and career progression in particular, with the aim of shaping policy and having it implemented at plant level.

CHAPTER 3

EXPLICATION OF PRESENT PROMOTIONAL SYSTEMS AND RESULTANT PROMOTIONAL PATTERNS

EXPLICATION OF PRESENT PROMOTIONAL SYSTEMS AND RESULTANT PROMOTIONAL PATTERNS

In order to prepare a Career Progression System for a site, the HDC approach[12] calls for an initial development of a profile of existing promotional patterns. The following types of data were collected at the Ohio and Detroit Plants:

(1) Detailed organizational staffing chart ranging from entry level through plant managerial positions, and including means and ranges of base pay for each job title, number of present incumbents and authorized staffing levels, and such certifications (credentials, degrees, experiences) as may be required or preferred for each job.

(2) Rules and procedures for promotion and transfer of non-management personnel.

(3) Current promotional pathways linking these job titles, whether the paths are governed by custom, whim, union-management collective bargaining agreement, or some other criteria.

Relevant statistics include data and level of hire, pay and promotional histories, and recorded movements from entry to exit (or present time), including changes in job title, terminations, lay-offs, retirements, death, etc. Personal demographic data correlated to work histories was also obtained.

(4) Ports of entry and exit in the job structure, including proportions of past incumbents promoted out of these jobs, jobs which seem to be "dead-ended", and jobs which seem to be "fast-tracks" upward.[13]

12/ See Increasing Employee Mobility Opportunities: An Employers' Handbook for System Design, an HDC publication describing in detail the approach used.

13/ Dead-end jobs may be defined as those jobs out of which incumbents seldom are promoted.

(5) Job descriptions of a general nature (which were replaced at a later date by HDC-generated Job Task and Requirement Analyses - JTRA's - in significantly greater detail).

(6) Indices of work force behavior, such as rates of turnover, separation, quitting, absenteeism, and tardiness.

(7) Indices of productivity, including scrap or waste rates and output/unit cost rates.

(8) External labor market data, including regional labor force demography, participation rates, skill surpluses and shortages, earnings statistics, job type distributions, turnover rates, etc.

(9) Estimates for near-term and long-term plant-level labor demand.

(10) Opinion surveys of the internal labor force, for the purpose of illuminating the empirical data collected about the internal labor market. This chapter contains a summary of the data collected on the Ohio and Detroit Plants and mobility of their respective work forces.

Ohio Plant

The Ohio Plant produces about twenty different components for the Corporation's major product line. Manufacturing processes there focus on machining. Operations are organized through a production-line technology, as opposed to a "job shop" format.

The Ohio Plant employs approximately 3000 persons, nearly half of whom are engaged in the manufacture of a single product accounting for some 50% of the plant's annual sales.

The Plant's work force is younger and less experienced than those at most of the Midwest Corporation's other plants. The relative youth and inexperience of the work force is thought by plant management to be a major factor in production problems.

The job structure for the Ohio Plant includes 29 different

rate ranges for non-management jobs, ranging, in 1972, from an hourly minimum of $3.17 to a maximum of $6.61. (See Figure 1 which gives pay grade for all non-management workers and the 1972 dollar equivalents for the production and maintenance workers.) The difference between the highest and lowest rates for the 17 pay levels in the hourly production segment is only $0.97 per hour; two-thirds of these classifications are contained within the even narrower range of $0.21 per hour. The promotion "space" is therefore very limited, unless there is a system for promotion into skilled trades and the clerical, technical and engineering jobs.

The relatively large number of production classifications and the fact that these classifications have existed in this industry for many years reflect the Plant's stable and narrowly defined job content, due largely to the combination of Taylorism and the capital intensity of the operation. The physical lay-out of the Plant, the nuerous pieces of heavy equipment, the conveyor systems, the processes involved - all lend themselves to stabilized personnel structures in the production and maintenance departments. The design, size and amount of investment in equipment tend to impose severe limitation on the disposition to restructure jobs, since this would usually involve restructuring the production process. HDC did not, therefore, propose any restructuring of the production or maintenance jobs.

The stated employment policy is to place entering employees into lower paying classifications, with the higher paying classifications within the production and maintenance category filled whenever possible through promotion. The Plant Personnel Department monitors staffing, promotion and transfer operations. Promotional and transfer procedures are laid down in the collective bargaining agreement for production and maintenance workers. These have been described in the previous chapter.[14/] In the past, actual employment policies and procedures have differed somewhat from the stated or formal procedures. Currently, there is strict adherence to writ, due in some measure to the recent assumption of duties by a new personnel manager.

14/ See Appendix A for highlights of the Collective Bargaining Agreement.

Figure 1

MACHINING PLANT
JOB STRUCTURE

PAY RANGE

GRADE

29

28

27

5.60-5.80

5.44-5.64

5.26-5.56

5.29-5.49

26

5.44

25

4.47-4.67

4.41-4.64

4.34-4.54

4.25-4.45

4.22-4.42

4.20-4.40

4.15-4.35

4.10-4.30

4.06-4.26

4.02-4.22

9

3.97-4.17

3.90-4.10

8

PLANT ENGR

MATL HANDLG ENGR

229

DESIGNER TOOL & DIE

2048

ENGR QUAL CONTR

25 6

DESIGNER "B" TOOL & DIE

2048 2

TOOL ENGR "B"

2118 6

INVESTIGATOR TOOL COST

217 4

PLANT ENGR "B"

2188 2

MATL CHEMIST OR METALLURGIST

253 1

QUAL CONTR ANALYST

2 4

TRAFFIC

245

FIRE MARSHALL

232 3

PATROLMAN

204

RATE CLERK

SHIPPING INSP

2004 11

SALVAGE INSP

2029 12

SCREW MACH POWER

2817 27

LAGGER MAINT

4929 0

CHECKING MACHINE

1812 0

GRINDER ROUGH

2758 4

COILING MACHINE

2687 4

SPRAYMAN

4588 6

MILLING MACHINE

2848 8

MATERIAL DISPATCH

3411 8

NIPON STRAIGHTENER

4632 12

MINOR ASSEMBLER

021 434

CLERK PROJ AND AUTH

243

CLERK BILLING

253

CLERK BOOKKEEPING

254

CLERK COST

255

CLERK WORK ORDER

256 3

CLERK INVOICE

257 6

CLERK PAYROLL

258 1

INTERVIEWER & QUALIFIER

207 2

F/U MAN PLANNING

222 6

SCHED MAN PLANNING

225 8

F/U MAN PLANNING

224 1

F/U MAN TOOL

258

CLERK TRAFFIC

241 2

TIMEKEEPER

282 3

SECRETARY

32 1

TECHNICAL LAB ENGR

541 6

ENGINEERING TECHNICIAN

515

SECRETARY

285 7

CLERK SUPT

256 4

CLERK GEN II

112 1

CLERK

KEYPUNCH

CLERK

T & O

KEY

JOB TITLE

0000 00

JOB CLASSIFICATION NUMBER — TOTAL INCUMBENTS PLANTWIDE

5.56-5.66

5.29-5.49

5.44

4.47-4.67

4.41-4.64

4.34-4.54

4.25-4.45

4.22-4.42

4.20-4.40

4.15-4.35

4.10-4.30

4.06-4.26

4.02-4.22

3.97-4.17

3.90-4.10

PLANNER "B"	TOOL ENGR "B"	INVEST GATOR TOOL CONT	PLANT ENGR "B"
2048 2	2118 6	219 4	2188 2

QUAL CONTROL ANALYST	CLERK TRAFFIC	FIRE MARSHALL	PATROLMAN	RATE CLERK
249 1	245 1	232 3	294 1	1

SHIPPING INSP	SALVAGE INSP	SCREW MACH POWER							
2004 11	2025 12	2017 27							
LABORER MAINT	CHECKING MACHINE	GRINDER ROUGH	COILING MACHINE	SPRAYMAN	MILLING MACHINE	MATERIAL DISPATCH	NIPON STRAIGHTENER		
4929 0	1812 8	2738 4	2687 4	4383 6	2948 8	3411 8	4832 12		
							MINOR ASSEMBLER		
							0211 435		

CLERK ORDG AND AUTH	CLERK BILLING	CLERK TRACKING	CLERK COST	CLERK WORK ORDER	CLERK INVOICE	CLERK PAYROLL	INTERVIEWER & QUALIFIER	F/U MAN PLANNING	SCHED MAN PLANNING	SPEC MAN PLANNING	F/U TOOL	
043 1	055	054 1	059 1	058 3	057 8	058 1	207 2	222 8	223 8	224 5	238	
CLERK TRAFFIC												
243 2												
TIMEKEEPER	SECRETARY	TECHNICIAN LAB ENGR	ENGINEERING TECHNICIAN									
082 3	132 1	561 8	575									
SECRETARY	CLERK SUPT	CLERK GEN II										
023	236 6	112 1										
CLERK GEN I	KEYPUNCH OPER "SR"	CLERK TYPIST	TOOL RESEARCH CLERK									
11 11	22 3											
STENOTYPE OPER	ADJUSTMENT INFO CLERK	TRAFFIC RATE CLERK										
8 1	30 1	245 1										
BILLING MACH CLERK	CLERK GR II	CLERK MAIL SERV										
22 1	10	410 1										

KEY

JOB TITLE

0000 00

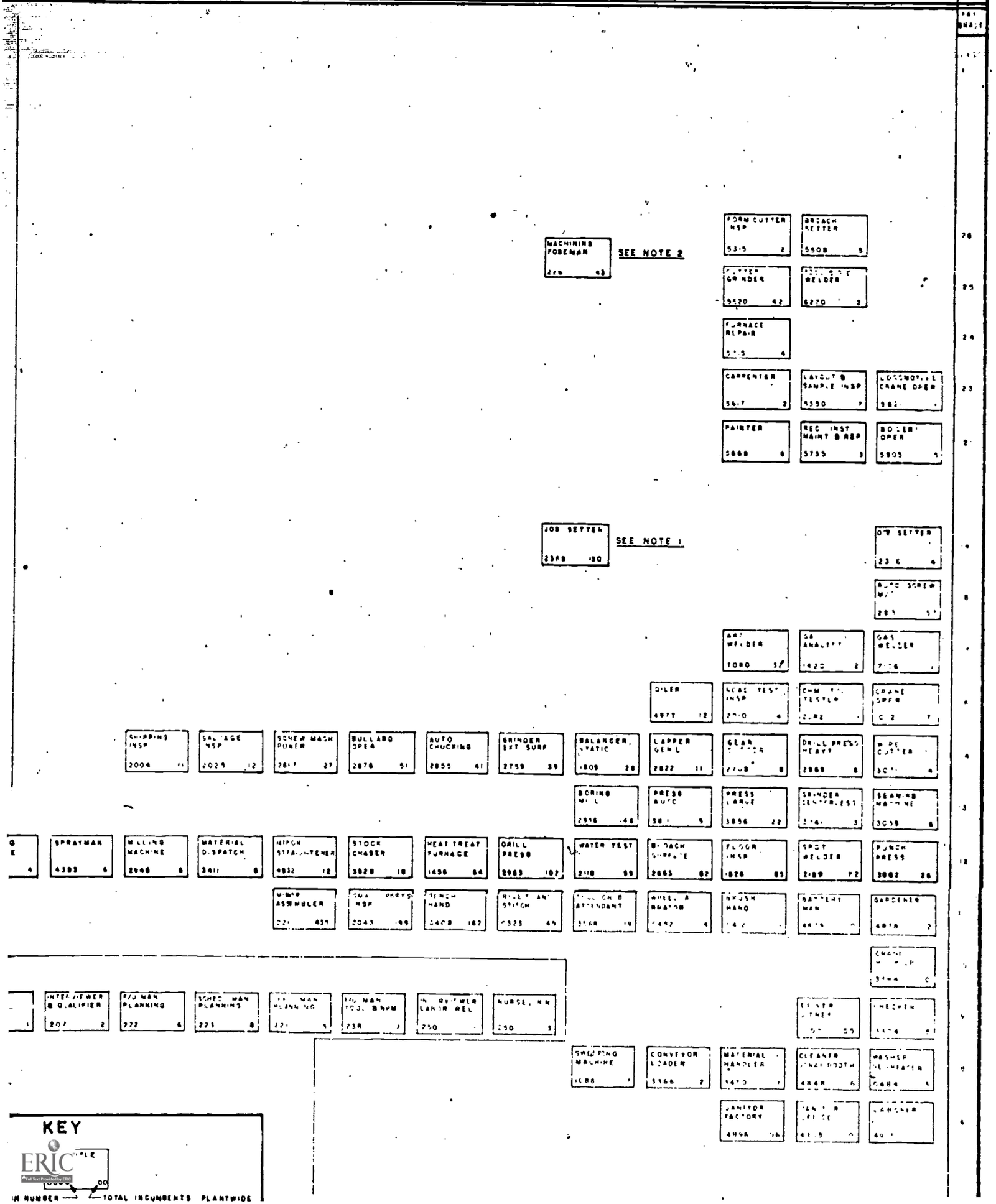
JOB CLASSIFICATION NUMBER → ← TOTAL INCUMBENTS PLANTWIDE

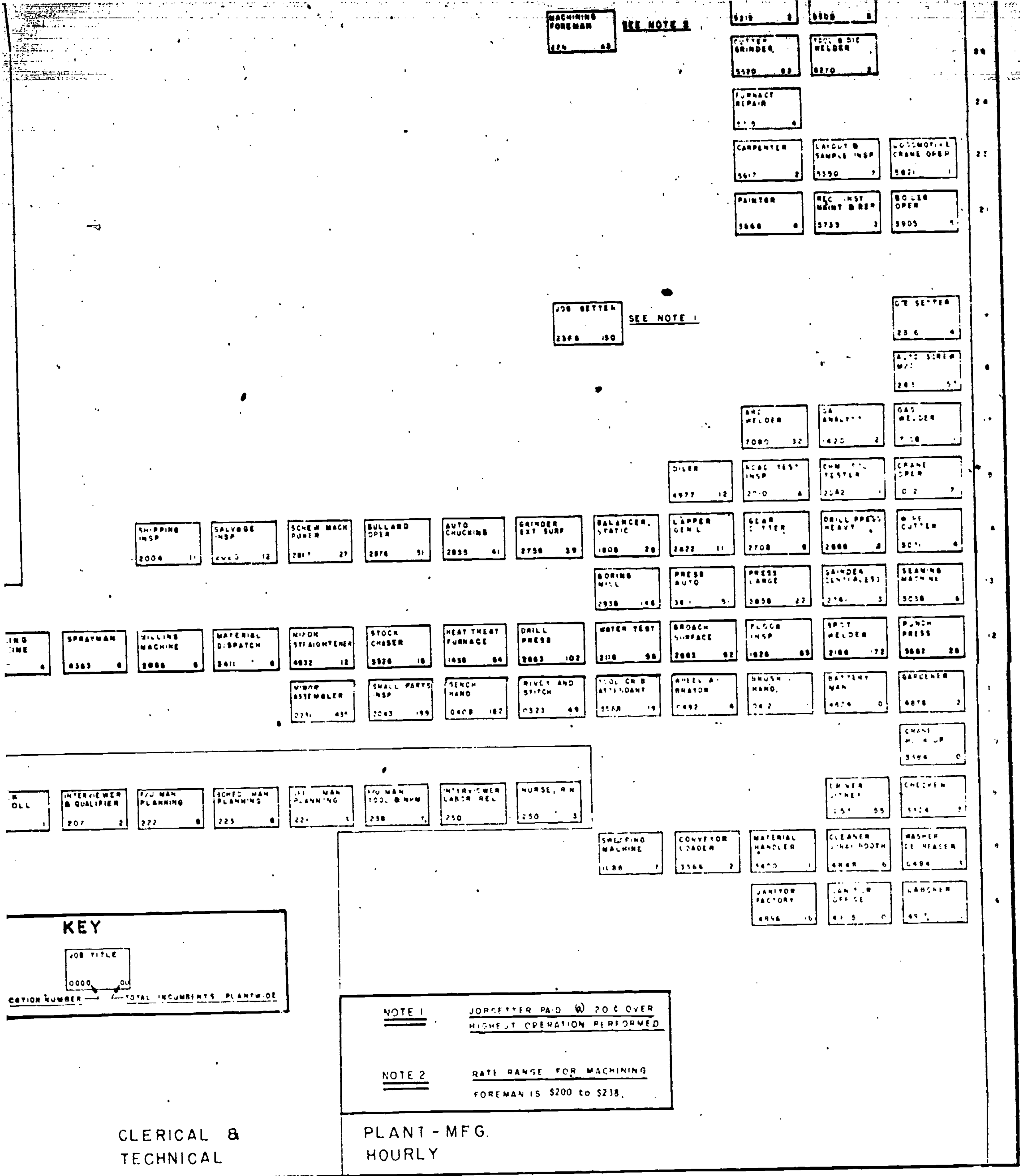
CLERICAL & TECHNICAL

PLA
HOU

Figure 1

MACHINING PLANT
JOB STRUCTURE




MACHINING FOREMAN
SEE NOTE 2
CUTTER GRINDER
TOOL & DIE WELDER
FURNACE REPAIR
CARPENTER
LAYOUT & SAMPLE INSP
LOCOMOTIVE CRANE OPER
PAINTER
REC INST MAINT & REP
BOILER OPER
JOB SETTER
SEE NOTE 1
ARC WELDER
GAS WELDER
OILER
CRANE OPER
SHIPPING INSP
SALVAGE INSP
SCREW MACH PUNCH
BULLARD OPER
AUTO CHUCKING
GRINDER EXT SURF
BALANCER, STATIC
LAPPER GEN'L
GEAR CUTTER
DRILL PRESS HEAVY
BORING MILL
PRESS AUTO
PRESS LARGE
SEAMING MACHINE
SPRAYMAN
MILLING MACHINE
MATERIAL DISPATCH
STOCK CHASER
HEAT TREAT FURNACE
DRILL PRESS
WATER TEST
BROACH SURFACE
FLOOR INSP
SPOT WELDER
PUNCH PRESS
MINOR ASSEMBLER
SMALL PARTS INSP
BENCH HAND
RIVET AND STITCH
TOOL CRIB ATTENDANT
BRUSH HAND
BATTERY MAN
GARDENER
INTERVIEWER & QUALIFIER
F/U MAN PLANNING
SCHED MAN PLANNING
F/U MAN TOOL & RPM
INTERVIEWER LABOR REL
NURSE, RN
CHECKER
SWEEPING MACHINE
CONVEYOR LOADER
MATERIAL HANDLER
CLEANER
WASHER
JANITOR FACTORY
JANITOR OFFICE
LAUNDER
KEY
JOB TITLE
0000
TOTAL INCUMBENTS PLANTWIDE
NOTE 1
JOBSETTER PAID @ 20¢ OVER HIGHEST OPERATION PERFORMED
NOTE 2
RATE RANGE FOR MACHINING FOREMAN IS $200 to $238.
CLERICAL & TECHNICAL
PLANT - MFG. HOURLY

The policies and procedures for promotion to apprentice openings differ from those generally governing promotion within the hourly production ranks. In addition to having at least twelve months tenure, an applicant for the apprenticeship program must satisfy standards set by a joint union-management apprenticeship committee, including minimum scores on an aptitude test battery. Selection from this list is governed by seniority. Each individual specifies three preferences among the skilled trades (e.g., electrician, pipefitter, die-maker). When an opening develops in one of his preferred trades, the senior person on the list is offered the opening.

Apprentice training consists of a combination of academic training and prolonged on-the-job training. The apprentice is dependent upon the journeyman for the quality of training and assistance received in the on-the-job training. Some journeymen adopt a "traditional" approach to the journeyman-apprentice relationship, including hazing, errand running, etc. For minority apprentices, the line between traditional hazing and discriminatory behavior can be a fine one. The apprentice training and counseling programs conducted by the Institute address this sensitive issue.

Each plant in the Corporation has a number of "non-apprenticeable trades" classifications, where no formal apprenticeship program has been established. Staffing for these classifications can, in theory, come through the "Upgrader Program", which consists of an eight-year schedule of training to develop proficiency equivalent to that of a journeyman in an apprenticeable trade.

Table 1 may be consulted for a summary of promotion and transfer procedures as described by the collective bargaining agreement and personnel policy documents.

Notwithstanding the seeming neutrality of these promotion and transfer procedures, all employees at the Ohio Plant do not appear to have had equal opportunity for promotion, and many skilled trades jobs (apprenticeable or non-apprenticeable) were not filled by promotion. Moreover, in promotions from hourly production classes to Foreman or general salaried positions, seniority is given less weight, with greater emphasis placed on aptitude and highly subjective considerations of temperament and experience. This process can lead to a discriminatory effect on minorities and women.

Table 1

Summary of Formal Transfer/Promotion Options and Requirements*

Type of Move	Procedure	Requirements/Restrictions
Within hourly production — Within Department	Selection by seniority and interest/ability	Demonstrate ability to perform during a 2-week trial period on-the-job.
Within hourly production — Between Departments	Openings not filled within the department are offered to employees who have completed a "Request for Promotion Opportunity" form.	An employee is limited to one "Employee Request" transfer in each twelve-month period.
Hourly Production to Skilled Trades	Selection based on seniority and ability. Employee is placed in "Upgrader Program" with schedule of work processes.	Approach used when qualified tradesmen are not available and apprenticeship program is "full" (maintain ratio of skilled tradesmen, apprentices).
Hourly Production to Apprenticeship Program	If test cut-offs are satisfied, employee specifies three trades classifications in order of preference. Most senior candidate with stated preference for trade is selected.	Employee must achieve minimum cut-off scores on aptitude tests. Selection from the apprentice waiting list is made on the basis of seniority.
Hourly Production to Manufacturing Foreman	Candidates are recommended by Foreman. Candidates complete Foreman Aptitude Test. Candidates complete Foreman Training Course.	Employee must have at least twelve months seniority. Must make satisfactory score on aptitude test.

* These are the policies and procedures described in the collective bargaining agreement and the personnel policy and procedures manuals.

The apparent departure from equal promotional opportunity that has existed in the past is illustrated by an analysis of mobility and staffing patterns at the Ohio Plant. Job histories were recorded for all employees hired into the principal product production area during the period August 1968 through September 1969. Of 270 persons hired, 108 were actively employed at the Plant as of December 1971, when the data were transcribed. (See Table 2) The data revealed that more than half of the active employee group was in the 18-25 age bracket; approximately 19% were minority group members; fewer than 3% were women.

Promotion. Comparisons between entry and current assignments for the sample are shown in Table 3. There was a general shift toward the higher paying jobs. All of the employees who advanced to the top of the hourly production group or into the skilled trades were white. Three of the five employees who had not moved out of their entry jobs were women. Since this sample of employees was hired in a relatively short time period (approximately twelve months), it is unlikely that seniority differences alone account for mobility discrepancies.

Analysis of the job histories of a sample of 76 JOBS trainees hired during the period 1968-1971 was performed to determine whether or not they were progressing at the same rate as "regular employees"[15/] Of the 76 JOBS participants, one in four was still in his or her entry job at December 1971. The comparable statistic for the sample of "regular hires" was one in twenty-one, indicating that JOBS trainees progress more slowly than other employees. Of the twenty-one women in the JOBS sample, only two had progressed out of the entry job, suggesting that female JOBS trainees may face even more difficult odds in advancing than male JOBS trainees.

Entry Jobs. Entry-job assignments for the sample of 270 employees and for a sample of 71 currently active JOBS trainees are presented in Table 4.

The data show that approximately 80% of the new employees were initially assigned as either Bench Hands or Minor

15/ This is not to suggest that JOBS employees are "irregular" employees, simply that the initial motivation behind their hire exceeded simple need-for-workers stimuli within the Plant.

Table 2

Demographic Distribution for Active and Separated* Samples

		AGE						RACE			MARITAL STATUS			
		Missing Data	18-22	23-25	26-35	36-45	46-55	White	Black	Mex-Am.	Single	Married	Divorced	Total
Active	Number	0	28	28	42	8	8	87	18	3	29	77	2	108
	(Cum. %)	(0)	(25)	(51)	(90)	(97)	(100)	(81)	(97)	(100)	(26)	(98)	(100)	
Separated	Number	4	70	36	43	6	3	123	33	5	79	80	2	162
	(Cum. %)	(2)	(46)	(68)	(94)	(98)	(100)	(77)	(97)	(100)	(49)	(99)	(100)	

		NUMBER OF DEPENDENTS				SEX		EDUCATION					
		0	1-3	4-6	≥7	Male	Female	0-6	7-9	10≤12	H.S. Diploma	Trade School	College
Active	Number	25	73	10	0	103	5	0	12	21	66	2	7
	(Cum. %)	(22)	(91)	(100)	-	(96)	(100)	(0)	(11)	(30)	(90)	(90)	(100)
Separated	Number	69	72	20	1	159	2	1	17	36	99	3	5
	(Cum. %)	(43)	(87)	(99)	(100)	(99)	(100)	(1)	(12)	(34)	(95)	(97)	(100)

*One "separated" individual moved from production and maintenance to an apprenticeable skilled trade.

Table 3

Entry and Current Classifications, Active Sample with Racial/Sex Break-Out

Hourly Rate Range	Job Classification	Entry Classifications***		Current Classifications			
				Minority		Non-Minority	
		Minority	Non-Minority	Male	Female	Male	Female
$5.44 - 5.64	*Grinder-Cutter	0	0	0	0	1	0
$5.36 - 5.56	*Furnace Repair	0	0	0	0	1	0
Variable	Plumbing Apprentice	0	0	0	0	2	0
Max. + $0.20**	Job Setter	0	0	0	0	2	0
$4.41 - 4.61	Screw Machine - Bar	0	0	0	0	1	0
$4.34 - 4.54	Arc Welder	0	0	0	0	1	0
$4.22 - 4.42	Balancer - Static	0	0	2	0	2	0
$4.22 - 4.42	Grinder-Exit, Int., Surf.	0	0	0	0	3	0
$4.22 - 4.42	Automatic Chucking	0	0	0	0	1	0
$4.22 - 4.42	Screw Machine - Power	0	0	0	0	3	0
$4.22 - 4.42	Bullard Operator	0	0	1	0	13	0
$4.20 - 4.40	Boring Mill - Diamond	0	1	3	2	14	0
$4.20 - 4.40	Press Operator - Auto	0	2	0	0	4	0
$4.20 - 4.40	Press Operator - Large	0	0	0	0	2	0
$4.15 - 4.35	Heat Treat Furnace	2	3	1	0	2	0
$4.15 - 4.35	Water Test (Of Welds)	0	3	1	0	0	0
$4.15 - 4.35	Broach Surface	1	0	0	0	2	0
$4.15 - 4.35	Grinder - Rough	0	0	0	0	1	0
$4.15 - 4.35	Drill Press	0	3	2	0	1	0
$4.15 - 4.35	Minor Straightener	0	0	0	0	1	0
$4.15 - 4.35	Spot Welder - Gun	1	5	3	0	10	0
$4.13 - 4.33	Punch Press	0	3	0	0	0	0
$4.10 - 4.30	Minor Assembler	29	97	0	3	3	0
$4.10 - 4.30	Rivert and Stitch	0	2	0	0	2	0
$4.10 - 4.30	Bench Hand	21	77	0	0	8	0
$4.10 - 4.30	Small Parts Inspector	0	2	2	0	4	0
$4.00 - 4.20	Wash and Degrease	0	2	0	0	0	0
$3.97 - 4.17	Cleaner - Spray Booth	0	0	0	0	1	0
$3.97 - 4.17	Conveyor Loader	1	3	0	0	0	0
$3.97 - 4.17	Material Handler	3	4	0	0	0	0
$3.90 - 4.10	Janitor - Factory	1	2	1	0	1	0
Total		59	209	16	5	86	0
Separated****		NA	NA	38		122	

*Non-apprenticeable skilled trades.
**Job Setter is paid $0.20 above the maximum rate of machines served.
***Missing data in two cases.
****Separated Sample: Missing data for two cases; one person entered an apprenticeable skilled trade classification.

Table 4

Entry Job Classifications
With Employment Status And Racial/Ethnic Break-outs

Job Classifications	Hourly Rate Range (Current)	Active		Separated*		JOBS
		Minority	Non-Minority	Minority	Non-Minority	Active
2936: Boring Mill - Diamond	$4.20 - 4.40				1	
3811: Press - Automatic	4.20 - 4.40		2			3
1455: Heat Treat Furnace	4.15 - 4.35		1	2	2	
2118: Water Test (of Welds)	4.15 - 4.35		1		2	1
2663: Broach Surface	4.15 - 4.35			1		
2963: Drill Press	4.15 - 4.35		1		2	1
7139: Spot Welder	4.15 - 4.35		2	1	3	
3862: Punch Press	4.13 - 4.33		1			
0251: Minor Assembler	4.10 - 4.30	14	37	15	60	36
0323: Rivet and Stitch	4.10 - 4.30		2			
0408: Bench Hand	4.10 - 4.30	4	32	17	45	26
2043: Small Parts Inspectors	4.10 - 4.30				2	
0484: Wash and Degrease	4.00 - 4.20				2	2
3366: Conveyor Loader	3.97 - 4.17		1	1	2	1
3450: Material Handler	3.97 - 4.17	2	1	1	1	
4896: Janitor - Factory	3.90 - 4.10	1	2			1
Total, Hourly Production		21	87	38	122	
		108		160		71

*Missing data for two cases.
**Separated Sample: Missing data for two cases; one person entered a skilled trade classification.

Assemblers. Within the key product operation as well as plant-wide, the two classifications account for approximately one-third of the total number of hourly production jobs. Together with the Small Parts Inspector, these are the normal entry ports for new hourly workers. There were no marked differences in the placement of minority and non-minority employees.

While not represented in the key production operations, other ports of entry to the total job structure are found in the general salaried segment and in the skilled trades segment of the Plant. Data extracted on a sample of 74 employees currently assigned to general salaried classifications revealed that 63% were hired into salaried positions. It was found that 86% of the skilled tradesmen were hired directly into a trades classification at the machining plant. In both instances, while these data may reflect the initial need to staff a newly built plant, they are also suggestive of missed promotional opportunities.

Separations. The sample of 270 individuals was analyzed from the viewpoint of turnover rates and the demographic characteristics of those who separated.

The annual separation rate, judged from the rate of separation of the sample members was 44% for production and maintenance workers. The separation rate was about equal among minority and non-minority workers, but involuntary separation was twice as high among minority workers compared with non-minority workers. (See Table 5.) The difference is not explainable by the data at hand.

Over 70% of separations occurred during the first three months of service. (See Table 6.) This is the probationary period during which time the employee has no seniority and limited rights under the collective bargaining agreement. It is a mutual "shifting out" period. It is to be expected, therefore, that 60% of the separated sample left the Plant in the entry-level jobs in which they had been hired.

The Detroit Plant

Like the Ohio Plant, the Detroit Plant is a major supplier of machined parts for Midwest Corporation's principal consumer durables. Many jobs in the two Plants are identical in title,

Table 5

Reasons for Separation by Race/Ethnic Group

(Among Sample of 162 Separated Production and Maintenance Workers)

Reason	Number		Percentage	
	Minority	Non-Minority	Minority	Non-Minority
Misconduct	13	15	34	12
Not Adapted For Work	5	2	13	2
Discharges - Cleared by Employment	6	16	16	13
Permanent Separation, Probationary Employee	1	11	3	9
Permanent Lay-off	0	1	--	1
Another Job	5	32	13	26
Return To School	2	4	5	3
Resignation - Other	1	17	3	14
A.W.O.L. Five Days	3	17	8	13
Did Not Return From Lay-off	2	8	5	7
Totals	38	123		
	161			
Missing Data	1			

Table 6

Terminations x Tenure
(Among Sample of 162 Separated Production and Maintenance Workers)

Tenure (Months)	Number	Cumulative Percentage
Less Than One	37	23
One To Three	78	71
Four To Six	1	71
Seven To Twelve	5	75
Thirteen To Twenty-four	35	96
More Than Twenty-four	6	100

although local differences were observed in the nature of the work performed within identical titles.

There are about 3,800 employees in the Detroit Plant, of whom 55% are minority group members (mostly black). As Tables 7 and 8 show, the bulk of the unskilled and semi-skilled workers are minority. Among the laborers and operatives in production and maintenance jobs, there is reasonably proportionate ethnic representation at all pay levels. In skilled, technical, professional, para-professional and managerial categories the great majority of incumbents are white.

The job structure in production and maintenance departments closely parallels that of the Ohio Plant. Pay levels, in 1972, ranged from $3.90 to $5.80 per hour, with the vast majority of employees in the $3.90 to $4.45 range. The same conclusion as to expanding promotional opportunities between departments and work areas as was drawn from the Ohio data can be drawn here, too.

Promotion. The Detroit Plant's formal personnel policies and procedures based on the collective bargaining agreement are identical to those of the Ohio Plant. However, there has been less recourse to informal promotion procedures than was at one time the case at the Ohio Plant.

Apprenticeable and non-apprenticeable skilled trades programs are identical with those described for the Ohio Plant.

Analysis of a 10% random sample of production and maintenance employees from 1967 (year of hire) through 1971 reveals considerable activity within the work force but only minimal mobility. There were no clear progression pathways - a reflection of the randomizing effect on mobility patterns of strict adherence to seniority provisions. Temporary separations and post-promotion backsliding are common, as the data for a sample of nineteen conveyor loaders indicates (see Figure 2). Of the four individuals who remained with the Detroit Plant at the time of the assessment, only one achieved a meaningful base pay increase (from $3.97 to $5.29 per hour).

There is a strong perception among hourly employees, particularly minorities, that promotions are not handled equitably.

Table 7

Demographic Distribution of Detroit Plant Employees

in Major Employment Categories

Employment Category	Total	Men	Women	Minority Men	Minority Women
Officials and Managers	302	302	0	79	0
Professionals	44	40	4	4	1
Technicians	47	47	0	4	0
Skilled Trades	466	465	1	35	1
Office and Clerical	65	35	30	7	6
Apprentices	47	46	1	10	1
Operatives (Semi-Skilled)	2797	2597	170	1936	140
Laborers	30	29	1	28	1
Administrative Trainees	6	6	0	5	0

Table 8

Demographic Distribution of Detroit Plant Employees

Among Production & Maintenance Jobs

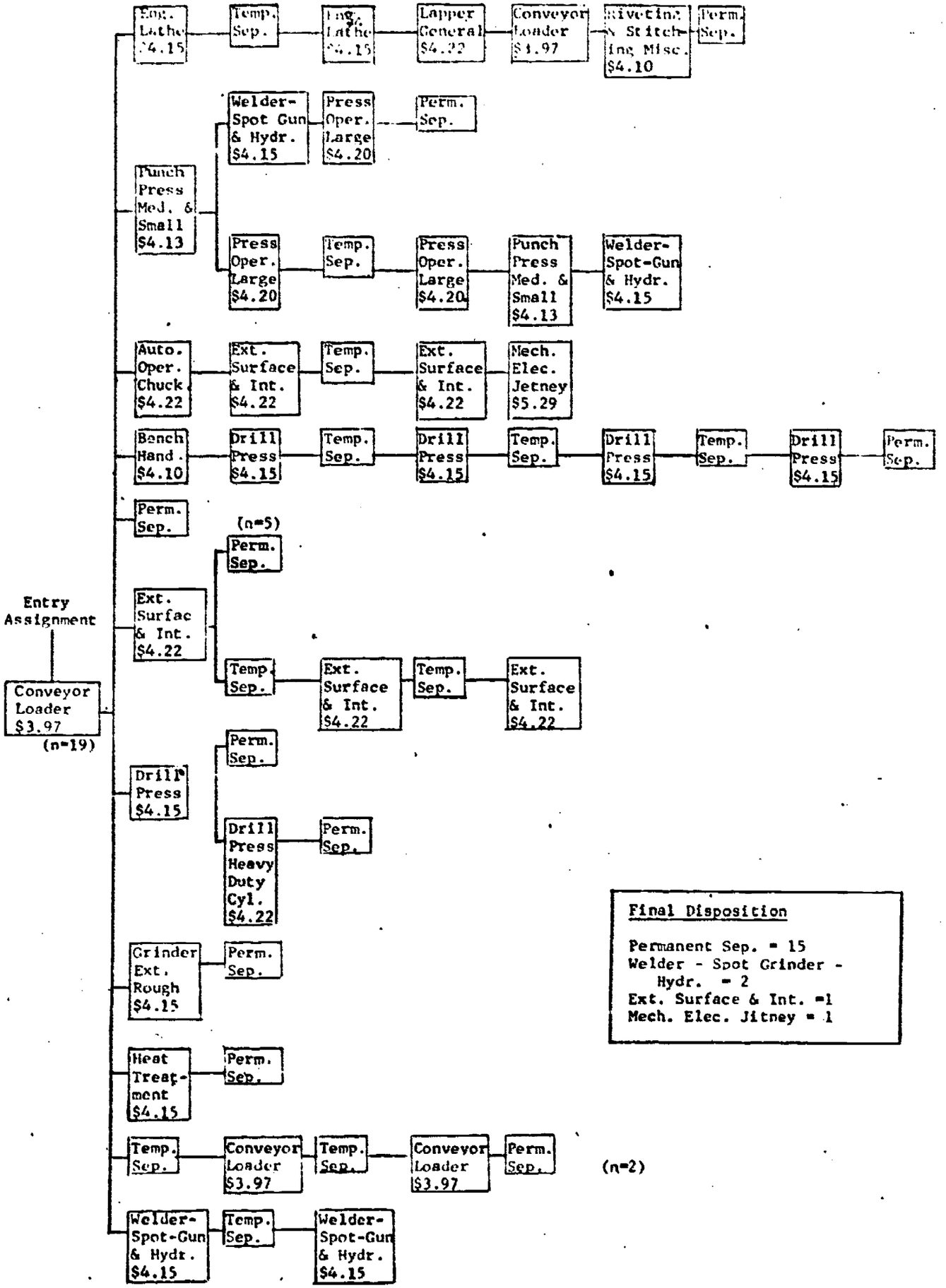
(As of 12/31/71)

JOB CLASSIFICATIONS	WAGE RANGE*	NON-MINORITY PERSONNEL	MINORITY PERSONNEL	WOMEN (NON MINORITY & MINORITY)
All Skilled-Code Classifications	$5.16-5.80	422	38	1
Job Setter Utility Relief	$4.45-varies	36	101	1
Automatic Screw Machine	$4.41	6	29	
Heat Treat Control Gas Analyst Gear Roll & Test -A	$4.34-4.40	21	14	
Tube Mill Operator Arc Welder Repairman	$4.34	51	117	
Chemical Solution Test Road Test Gear Roll & Test	$4.27	15	15	
Gear Cutter Upsetter	$4.27	18	59	
Tool Crib Attendant Oiler	$4.25	17	12	
Inspectors ("Pay Level" 11)	$4.22	74	117	
"Machining Job Family" Level 11 (0203;1686; 2759;2855;etc.)	$4.22	158	517	
Press Large	$4.20	9	10	
"Machining Job Family" Pay Level 9 (0242; 1455; 2663;2750;etc.)	$4.15	163	693	
Stock Chaser	$4.15	4	6	
Punch Press	$4.13	5	34	
Pay Level 7 (0323; 0287;0233;3324)	$4.10	8	34	
All Other Classifications, Pay Level 5 or Lower	$3.90-4.06	52	254	

*Minimum Rate for each classification; rates in effect prior to 11/22/72.

Figure 2

Example of Mobility Patterns for a Sample of Midwest Machining Plant Employees



A survey of seventeen hourly workers carried out in mid-1972[16] suggests the belief that (a) promotion depends on being a "pal" of the foreman; (b) insufficient consideration is given to ability to do the higher level work;[17] and (c) eligible employees are frequently not notified about job openings.[18]

The same sample reveals some disparity in wage increments between minorities and non-minorities. After standardization for seniority, minority workers were found in 1969 and 1970, to have average monthly rates of increase in hourly wages which were 35% to 43% of the white workers' rates.

Entry Jobs and Separations. Entry jobs are similar to those of the Ohio Plant, with the addition of Conveyor Loader, currently the major entry port.

Separation rates among production and maintenance workers range from a healthy 3% per annum among apprentices and the top end of the semi-skilled jobs, through 10% for the skilled trades, down to 52% for the bottom end of the semi-skilled group (really, the unskilled workers.) (See Table 9.) This latter figure to some extent reflects the three-month probationary period with its inevitably higher turnover than that among workers who have passed through this period. Nonetheless, it is a disturbingly high percentage.

The figure of 32% for inspection jobs is surprisingly high; no reason for it can be cited with confidence at present.

The analysis of personnel data from the two machining plants confirmed some of the hypotheses on which HDC had entered the plants, namely that progression opportunities to skilled, professional or management jobs were severely limited for unskilled and semi-skilled workers and that opportunities were not necessarily equally distributed between ethnic groups

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16/ The survey is reported in full in Status Report No. 6, August 23, 1972.

17/ Recall the concurrent union-management belief that ability criteria would be too difficult to negotiate, and therefore remain indefinite in the bargaining agreement and of minimal importance in the promotion process.

18/ Job openings are not posted and employees do not bid on openings, but after a slot is filled a more senior worker who was unaware of the opening may not challenge the promotion of a less senior colleague.

Table 9

Median Annual Separation Rates for Selected Job Classifications

(Median of Average Separation Rates within Job Classification Clusters, Years 1968, 1969 & 1971 Combined) *

Job Classification Cluster	Median of Average Annual % Separation Rates
Skilled Trades	10
Apprentices	3
Higher-Level, Semi-Skilled (Job Setter, Utility, Auto Screw, Etc.)	3
Semi-Skilled Inspection Jobs	32
Lower-Level, Semi-Skilled	52

*1970 data is omitted because of abnormal separation rates.

and the sexes. As described above, there was little upward mobility and such as there was, favored white males. There were no visible career progression lines that an employee could follow in order to obtain, in a predictable time, some desired position. Promotion was often seen as a result of favoritism, despite the wording of the collective bargaining agreement.

Given all this, it appeared that the employees would benefit and would stay longer and work more productively if the promotion practices were systematized along new lines.

CHAPTER 4

THE PROPOSED CAREER PROGRESSION SYSTEMS FOR THE MACHINING PLANTS

PROPOSED CAREER PROGRESSION SYSTEMS FOR THE MACHINING PLANTS

The career progression systems described in this section were designed to expand and make "visible", the options for movement of employees upward in the Ohio and Detroit Plants.

Naturally, uncontrolled movement from job to job within a plant is a manager's nightmare. The proposed designs to promote through sequences of skill/knowledge would permit related jobs control to be maintained, but would be based on prior skill/knowledge and not exclusively on departmental experience.

The net consequence would be the expansion of the domain over which seniority could be exercised, to include a whole family of jobs irrespective of department or work area, yet the promoted employee would be equipped to perform because of prior experience in the family.

This theoretically attractive "model" was accepted by the Institute and by the Ohio Plant management (where HDC commenced work) and the detailed design work proceeded from there.

Recommended Design of the Career Progression System for the Ohio Plant

Structure. A career progression system was proposed by HDC for the Ohio Plant and was accepted by management in late 1972, as a basis for an eventual implementation. The design was based on the following procedures: eighty production jobs were analyzed in detail through the use of the Job Task and Requirements Analysis (JTRA) technique; twenty-two of these were subjected to statistical cluster analysis.

The linkages tying the production and maintenance area into the clerical, technical and engineering areas were inferential, though not inconsistent with similar HDC exercises in other industries.

Figure 3 shows the recommended lines of progression between jobs, to replace the existing idiosyncratic progression channels. It should be noted that:

- The proposed structure is not split by departmental boundaries, and thus promotion may occur on the basis of skills/knowledge relationships, unhindered by these artificial demarcations. Presently, a production employee transferring departments is automatically downgraded in pay, to some extent discouraging occupationally logical inter-departmental movement. In the proposed system, this would not happen. At present, movement between blue and white collar jobs is rare. The new system, without departmental boundaries, encourages such progressions.

- At lower levels, all production and maintenance jobs are linked to each other - from level 8 ($3.90 - $4.10 per hour) up to any production job at level 12 ($4.15 - $4.35 per hour). At this point, there emerges a family of machining jobs through which an employee can progress. At any one of these pay levels, jobs are virtually interchangeable in their skill/knowledge requirements. There is also an inspection family, starting with Small Parts Inspector at level 11, which links with machining jobs.

- There are direct routes from the machining and inspection families to the non-apprenticeable skilled trades. (By "direct route" we mean that previous work experiences largely prepare a promotee for a new job.) Connections between these families and apprenticeable trades may be accomplished through supplemental training, both on- and off-the-job.

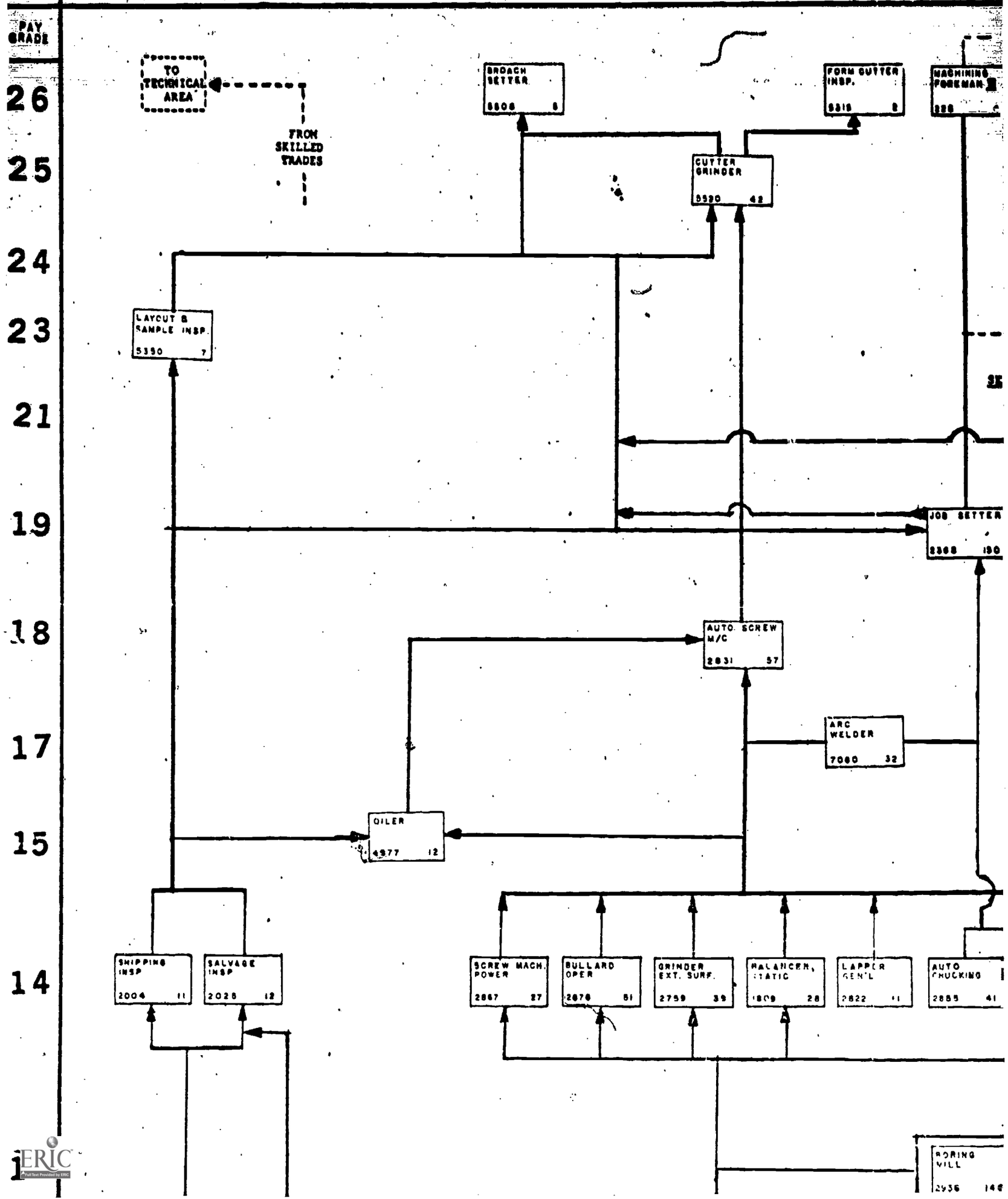
Process. At the time this promotional structure was presented to management, a corresponding procedural plan (or process) for managing the system was provided:

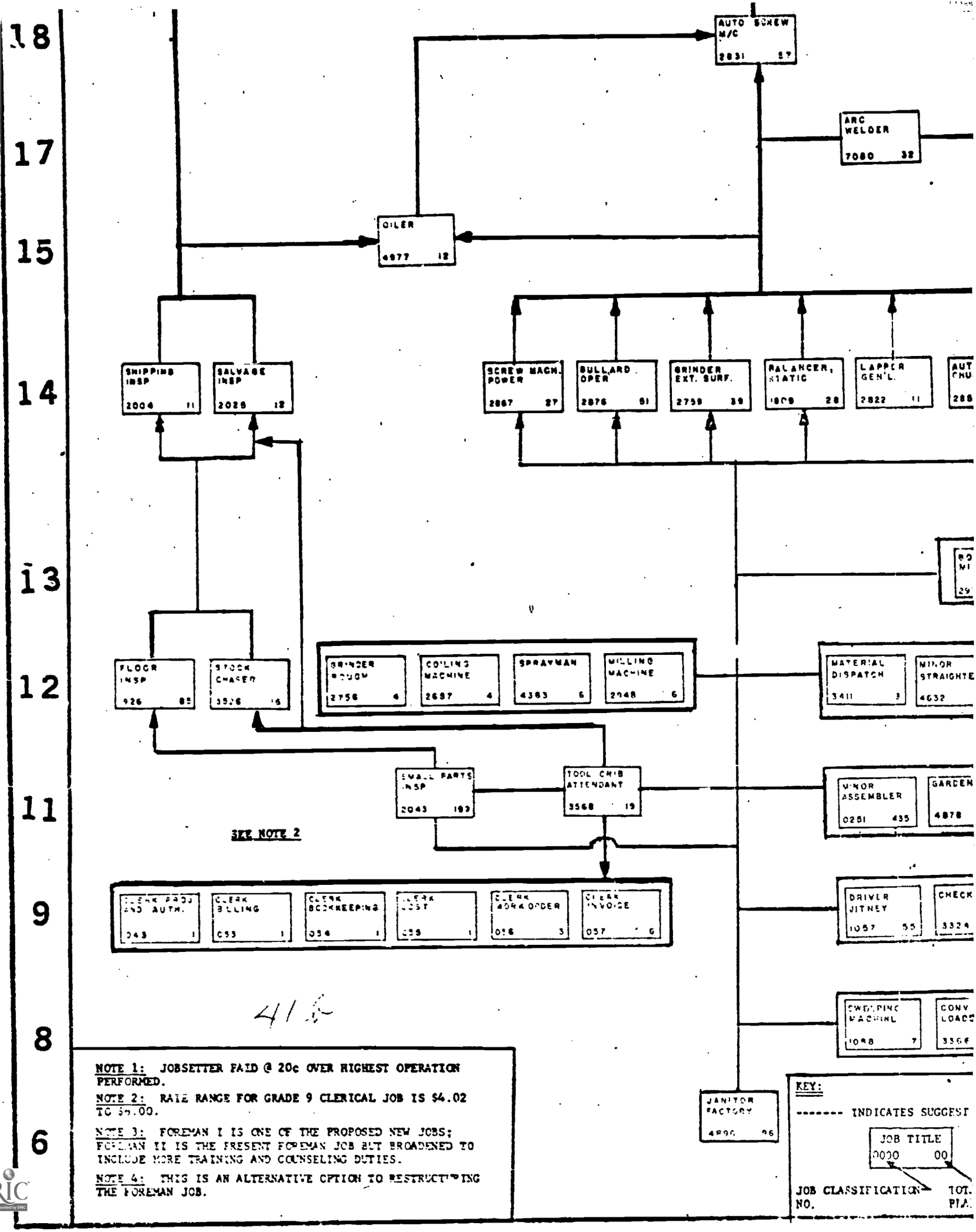
Figure 3

PROPOSED UPWARD MOBILITY STRUCTU

MACHINING PLANT

41c





41 C

NOTE 1: JOBSETTER PAID @ 20¢ OVER HIGHEST OPERATION PERFORMED.

NOTE 2: RATE RANGE FOR GRADE 9 CLERICAL JOB IS $4.02 TO $5.00.

NOTE 3: FOREMAN I IS ONE OF THE PROPOSED NEW JOBS; FOREMAN II IS THE PRESENT FOREMAN JOB BUT BROADENED TO INCLUDE MORE TRAINING AND COUNSELING DUTIES.

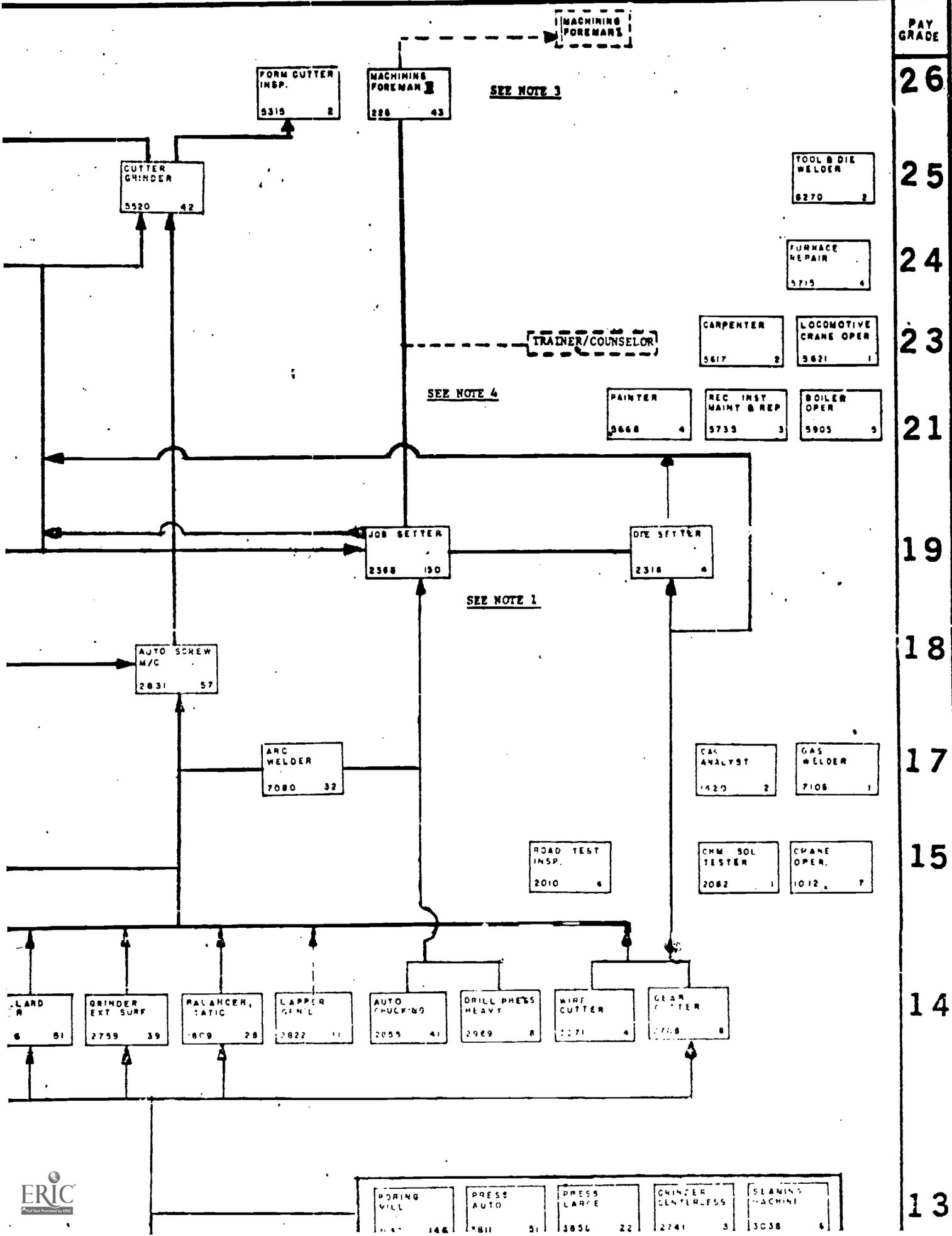
NOTE 4: THIS IS AN ALTERNATIVE OPTION TO RESTRUCTURING THE FOREMAN JOB.

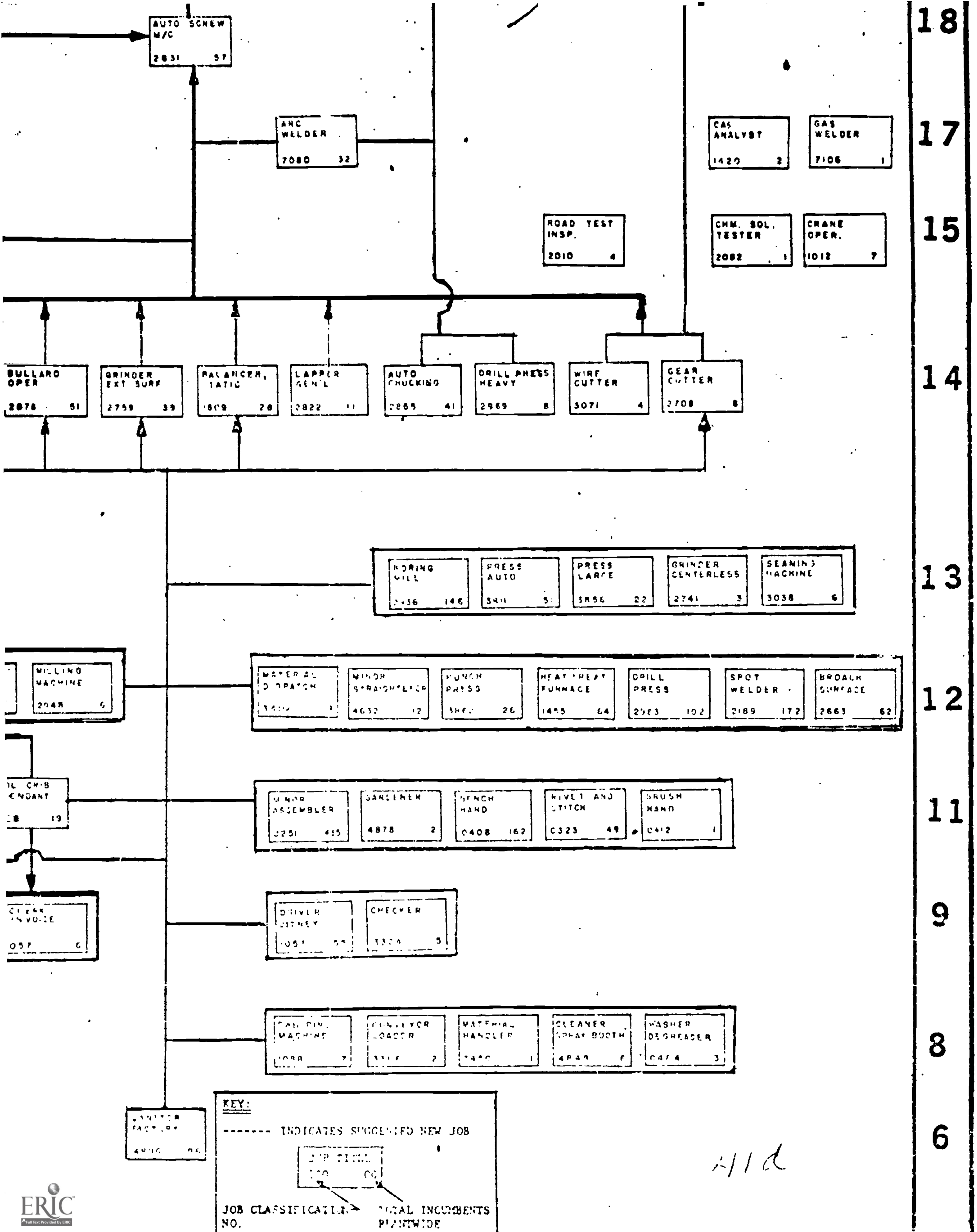
Figure 3

PWARD MOBILITY STRUCTURE

ACHINING PLAN

410




18
AUTO SCREW M/C 2831 57
17
ARC WELDER 7080 32
GAS ANALYST 1420 2
GAS WELDER 7106 1
15
ROAD TEST INSP. 2010 4
CHM. SOL. TESTER 2082 1
CRANE OPER. 1012 7
14
BULLARD OPER 2878 51
GRINDER EXT SURF 2759 39
2822 11
AUTO CHUCKING 2885 41
DRILL PRESS HEAVY 2969 8
WIRE CUTTER 3071 4
GEAR CUTTER 2708 8
13
BORING MILL 146
PRESS AUTO
PRESS LARGE 22
GRINDER CENTERLESS 2741 3
SEAMING MACHINE 3038 6
12
MILLING MACHINE 2048 6
MINOR 4032 12
PUNCH PRESS 26
HEAT TREAT FURNACE 1455 64
DRILL PRESS 102
SPOT WELDER 2189 172
BROACH SURFACE 2663 62
11
ASSEMBLER 415
GARDENER 4878 2
BENCH HAND 0408 162
RIVET AND STITCH 0323 49
BRUSH HAND 0412 1
9
CHECKER 5
8
MACHINE 7
CONVEYOR LOADER 2
MATERIAL HANDLER 1
CLEANER SPRAY BOOTH 6
WASHER DEGREASER 3
6
KEY:
------- INDICATES SUGGESTED NEW JOB
JOB CLASSIFICATION NO.
TOTAL INCUMBENTS PLANTWIDE

- Experience in a prescribed sequence of skill/knowledge related jobs should be a major criterion for promotion (along with seniority). Current practice should be modified so that a worker need not revert to a lower pay classification when inter-departmental transfers occur.

- Skills training curricula should be developed from JTRA data, for use in on-the-job training for all promoted employees.

- Career counseling should be provided for all employees, regardless of their status with respect to promotion.

- All qualified candidates for promotion should be identified and reviewed; alternatively, a job posting and application procedure should be initiated.

- All plant personnel should be advised of the experimental presence of the new system, and counseled as to its mechanics.

- A system should be developed for tracking employee mobility, and cost/benefit or cost/effectiveness techniques should be applied to assess the impact of the new mobility system.

  In order for the career mobility system to survive the withdrawal of direct assistance by researchers, it was important for plant personnel to share responsibility for the implementation of the model system. To this end alternative recommendations were offered for the management and use of the newly activated system.

- Foremen should be trained in counseling and human relations techniques and given time to serve the personal and career needs of their workers through creation of the "Senior Foreman" position in areas of the plant having high worker mobility; or

  Workers responsible for OJT supervision should be given training in the teaching of skills to their less senior colleagues; or

Training and Development Specialist position should be created within the manufacturing area; this professional should supervise and administer the orientation, counseling and training of employees. A ratio of one such specialist to every 75-150 employees was recommended.

- Seniority should be redefined in plant-level labor-management negotiations so that length of tenure in job family rather than in production department would be available. This would facilitate acceptance of prior in-plant experience as one of the promotion criteria - it is, in fact, just another way of describing this criterion.

- Institute personnel, rather than plant or corporate headquarters staff, should be primarily responsible for curriculum development and choice of instructional formats and methods. Skills training curricula outlines could be derived directly from the JTRA's prepared by HDC. Over the long range the Institute should investigate the use of on-the-job experience for "life credits" toward academic credentials from area colleges - a prerequisite for firmly linking production jobs to white collar, technical and engineering careers.

- Concurrent with career system implementation, the Institute should work with HDC in refining the design of an evaluation system for (a) assessing the impact of the career progression program on actual job movement by low-skill workers, and (b) measuring the effects of the new system on such matters as absenteeism, turnover and productivity. Additionally, effort was recommended toward improving the rigor of cost/benefit techniques compatible with this system.

The system as proposed was accepted by Institute personnel as theoretically sound and an excellent basis for a modest revolution in plant personnel policy. It was accepted by Plant management as well in conceptual terms. Nevertheless, the proposed career system was not implemented at the Ohio Plant for reasons already discussed in Chapter 2.

Thought had then to be given to the development of a partial implementation plan which would conform to the collective bargaining agreement while providing sufficient, easily accessible data for a cost/benefit analysis.[19]

Two departments at the Ohio Plant were chosen for this partial implementation. All hourly jobs within the Wheel Cylinder Machining and Master Brake Machining Departments were linked into two distinct career progression structures with "inlet" linkages to the rest of the Plant's Production and Maintenance jobs at crucial junctures in the structures (see Figures 4 and 5).

The design of the partial implementation plan recognized and conformed to seniority constraints in intra-departmental promotion, but specified that when the personnel department resorted to transfer application lists, the selection process was to be opened to a second criterion of eligibility - that of previous relevant job incumbency in the Plant, judged according to the full-scale career structure paths as initially proposed by HDC. In addition, formalized on-the-job training is being provided to all promotees by line trainers who were trained in the development of OJT behavioral objectives based on task listing for each job.

These procedures are now in operation. When a vacancy cannot be filled from within the department, Labor Control is informed and asked to submit a candidate from the transfer application list. HDC has provided a "map" showing the jobs most suited as sources of promotees for each possible vacant job. This will be used to locate suitable candidates although seniority will also be taken into account.

Career counseling was omitted from the compromise program. It will be recalled that the union was opposed to the use of the ability provision in the selection of promotees. The

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[19] The model which has been used as the basis for the design of a cost/benefit analysis procedure (now nearly completed for the Ohio Plant) is described in Appendix B.

Figure 4

Career Progression Structure
In Master Brake Machining Department
(Numbers in parenthesis = number of job incumbents)

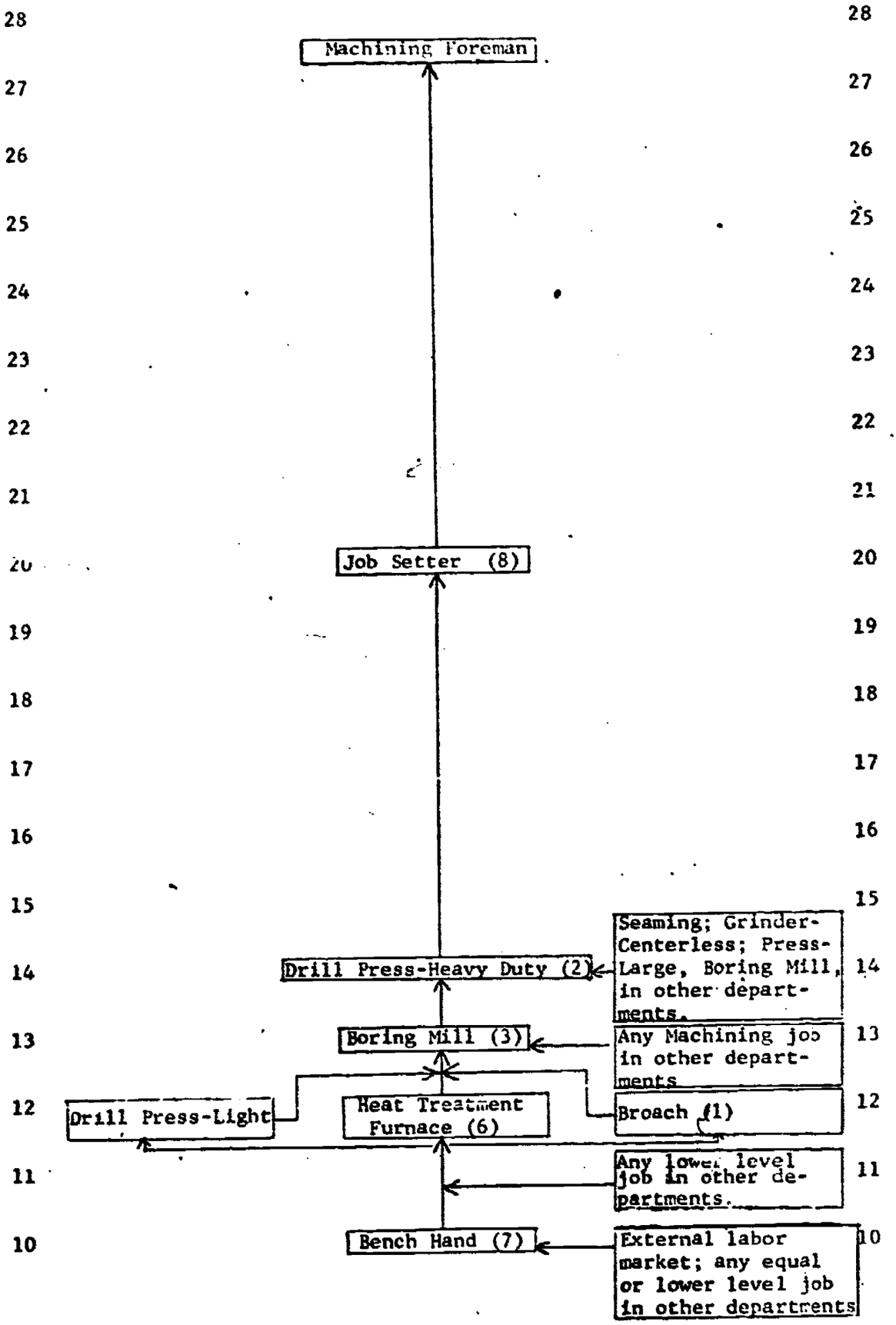
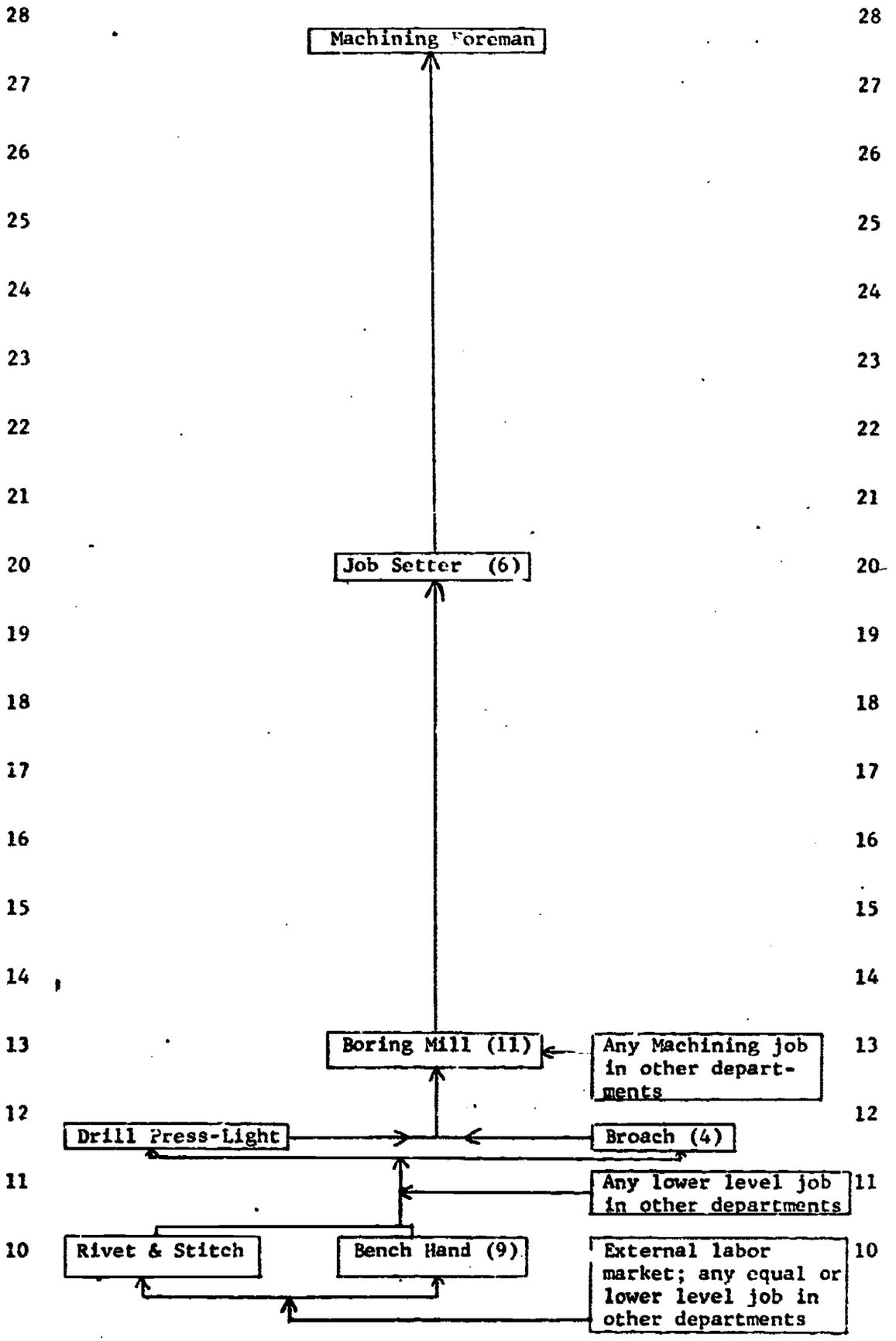


Figure 5

Career Progression Structure in Wheel Cylinder Machining Department



partial implementation program called for use of "previous relevant job incumbency" criteria in selection from transfer lists. While not strictly equivalent to an ability provision, there was in the partial plan the seeds of a precedent defining ability which the Union wished to avoid. Omission of the counseling function meant that management alone could review transfer lists - as they had done always - and alone could determine eligibility - as they had done always - using a mixture of seniority plus "other factors". Workers never knew they were potentially eligible for interdepartmental transfer into higher pay grades as a reflection of previous experience, and the Union never had to acknowledge publicly their complicity with an experiment in the (limited) use in the promotion process of "ability" assessments.

In the cost/benefit area, work has gone ahead on designing, in detail, a procedure which can be implemented at the Ohio Plant, even though the progression system has been so fragmented as to make it somewhat dubious as to whether meaningful results can be obtained. If, as is hoped, something much closer to the initial design is implemented during 1974, the cost/benefit and other evaluation tools will be ready for immediate use.

Recommended Design of the Career Progression System for the Detroit Plant

Although the concept of inter-departmental movement of production and maintenance workers was not accepted as readily at the Detroit Plant as at Ohio, management agreed that it was worth designing a system which incorporated such a process. HDC did so in the belief that eventually the logic of the design would overcome management's anxieties about reduced labor control. Certainly, the rationale for the design was at least as strong at Detroit as at Ohio.

A procedure similar to that used at Ohio was followed. A total of 88 production and maintenance jobs were observed and analyzed in the Detroit Plant. This represents at least one job in each classification.[20] Each job was rated on skill and knowledge requirements; the data were then used to compute statistical indices of job similarity.

20/ A similar process was undertaken for clerical, engineering and technical jobs (CET). The progression structure within CET jobs and between them and P&M jobs is currently being designed.

Structure. Based on the emergent natural clusters and sequences of jobs of similar index value, a recommended career progression structure for production and maintenance jobs was constructed (see Figure 6). The jobs on the right side of the chart (jobs bracketed with Cycleweld Assembler at level 7, Heat Treat Operator at level 9, and Gear Adjuster at level 11) form what may be called a "machining" job family. The jobs at center-left (e.g., Axle Inspector, All-Around Inspector, Chemical Solution Test, and Gas Analyst) represent an "inspection and test laboratory" job family. The jobs at the far left (Jitney Driver, Stock Chaser, Tool Crib Attendant) constitute a "material handling and control" job family.

Most of the jobs through level 9, and some of the machining jobs at level 11, are relatively low in their skill requirements; therefore, all jobs link upward with each other through pay level 9. At present, there is movement between most of the jobs at these lower levels, but it is non-systematic movement. The emergence of job families and of career opportunities was heretofore not apparent to employees or employer.

Figure 6 not only shows the recommended paths but also the most common existing paths, as determined from the 10% sample described in the previous chapter. It will be seen that new paths have been added. Not shown on the chart are the numerous lateral and downward movements of employees who eventually progressed along the lines shown. Many of these would be completely eliminated by the proposed process (those, for example, attributable to the acceptance of a lower paying job in order, hopefully, to be promoted later to a desired job in the new department).

Process. Our recommendation to the Detroit Plant management was that the essential features of an "ideal mobility system" be implemented and evaluated on a controlled, experimental basis. The following description is a quotation from the HDC report to Detroit management:

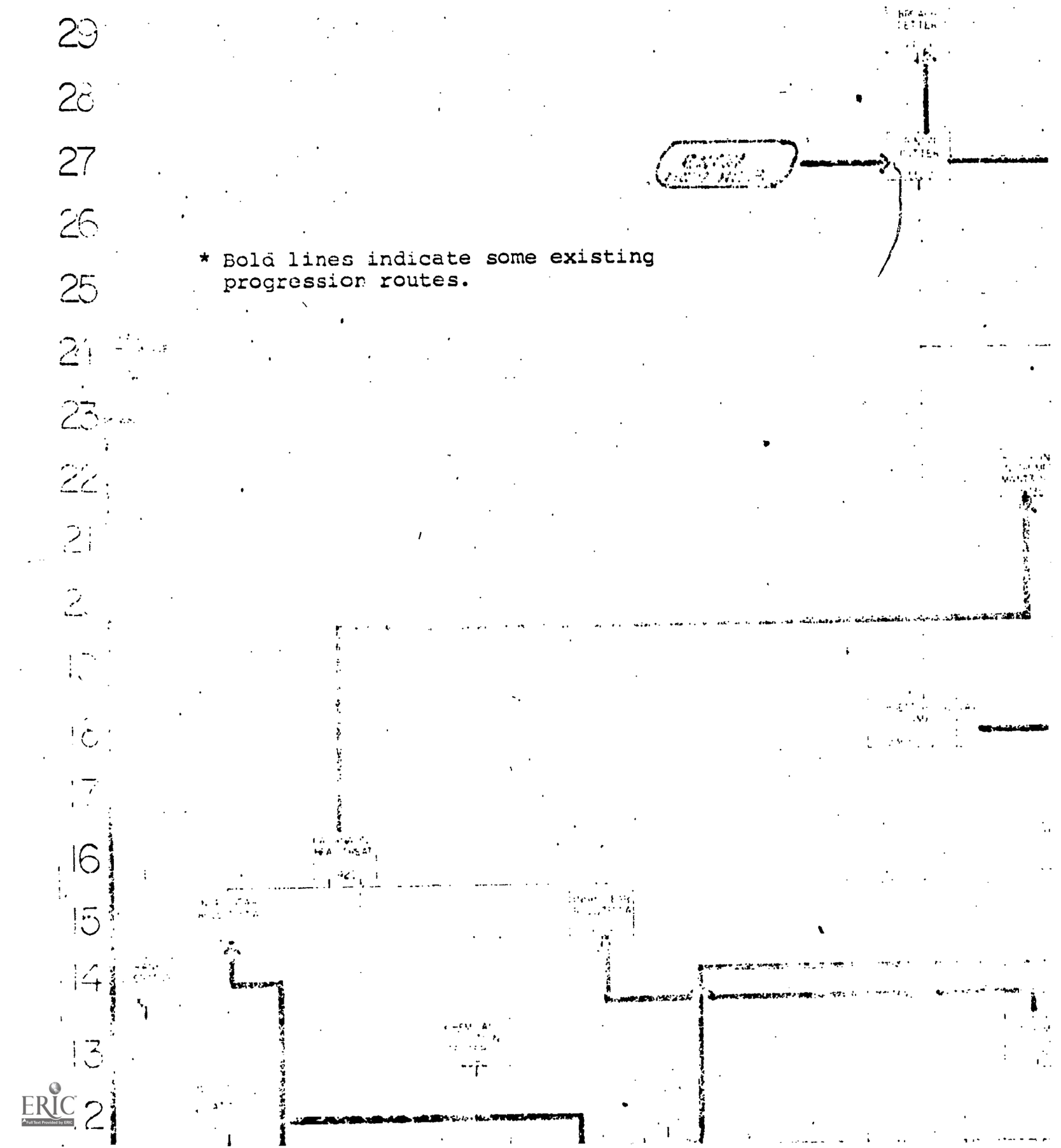
"The essential features of the system are:

1) a defined network of skill linkages among jobs (progression opportunity map);

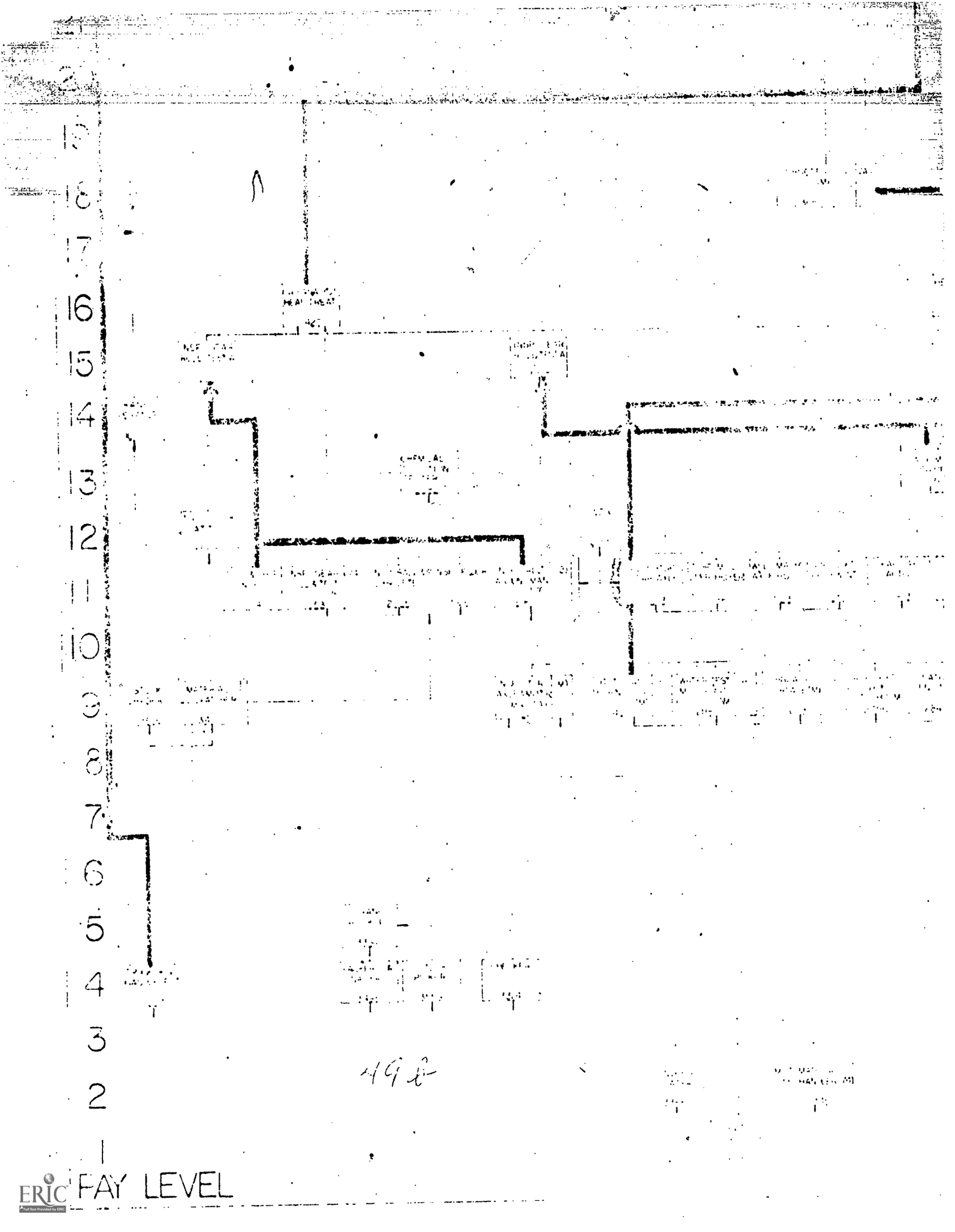
2) a systematic approach to training in each classification;

FIGURE 6

A COMPARISON OF EXISTING AND RECOMMENDED PROGRESSION ROUTES FOR DETROIT MACHINING PLANT



* Bold lines indicate some existing progression routes.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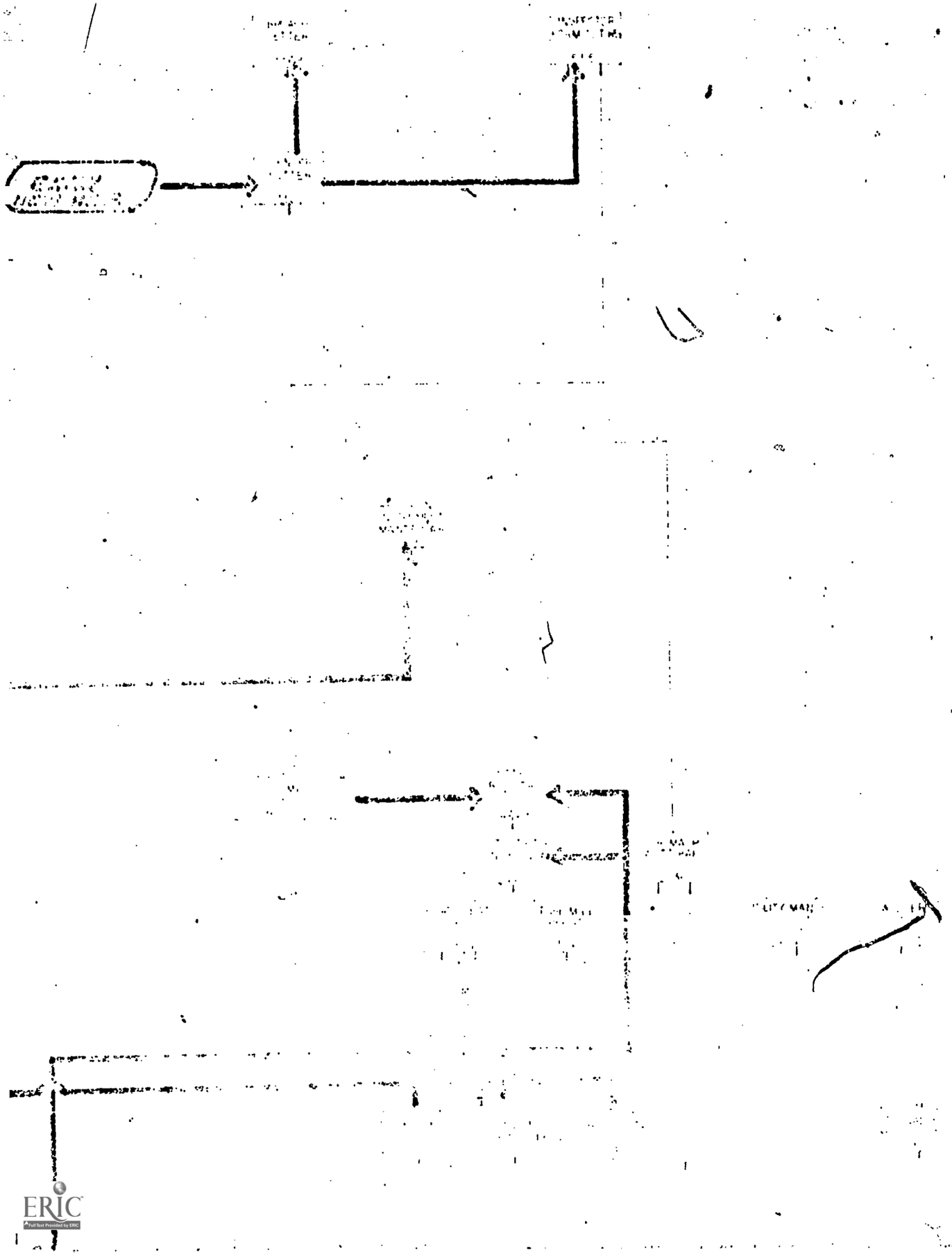
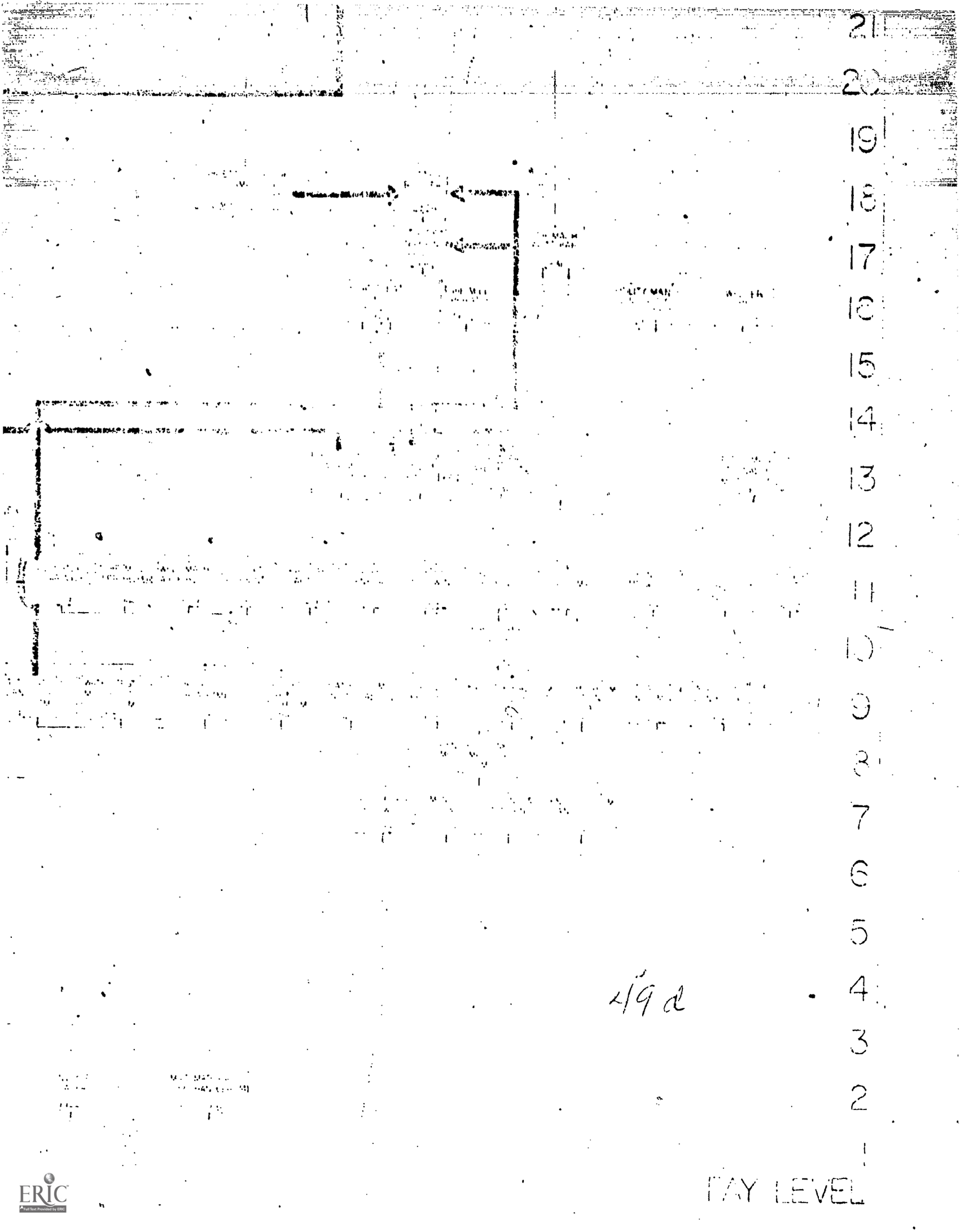
2
1
BAY LEVEL

FIGURE 6

A COMPARISON OF EXISTING AND RECOMMENDED PROGRESSION ROUTES FOR THE DETROIT MACHINING PLANT




21
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PAY LEVEL

3) counseling and communication of progression opportunities and resources available to employees; and

4) the application of consistent rules to govern the movement of employees through the job/progression structure.

"Changes on items 1) through 3) clearly can be accomplished within the provisions of the collective bargaining agreement. Item 4), the application of rules governing transfer and promotion, is not so clear-cut with respect to conformance with the existing contract. If all promotions were governed by seniority in the appropriate sequence of jobs as defined in the progression map, then changes in the collective bargaining agreement would be necessary. In many areas, however, promotion on the basis of experience in the "correct" previous job can be accomplished within the provisions of Sections 66) and 71) of the production and maintenance contract.[21]

"In a sense, the National Contract, Local Supplemental Agreement and Memoranda of Understanding define boundaries for the promotion/transfer procedures. The current and historical practice further defines the procedures. It is possible to gradually and "quietly" improve the practice, without violating the terms and spirit of the contract and without escalating the changes to contract negotiation issue.

"To carry out a pilot test of the new system, we need to do the following:

1) Select departments to be included in the experiment. These should be departments where measurement of individual performance is possible.

2) Determine who will conduct the formal training of new job incumbents.

21/ Section 71) states that promotions to higher-paid jobs shall be based on seniority and ability to do the work. Section 66) outlines the procedures for inter-departmental transfers.

3) Select the trainers (if the trainers are individuals other than the foreman) and train them in job instruction techniques.

4) Define the group of individuals who will receive career counseling, e.g.,:

   a) All employees who are in or who enter the experimental department(s) or

   b) All employees who have completed Section 66) transfer requests or

   c) Employees who have requested Section 66) transfers to the experimental department(s).

5) Set up procedures to track the employees counseled, promoted, and trained in the experimental department(s).

6) Conduct formal on-the-job training for all individuals entering a new job in the experimental department(s).

7) Track and compare the performance of employees who are promoted according to a "correct" career path with those who are promoted through an "incorrect" path.

"If it is possible to track the performance of individuals in one or more departments, we will be able to reliably compute a benefit/cost ratio for the experimental mobility system. A model for computing the benefit/cost ratio has been set up.[22] Briefly, this model proposes to compare the value-added to parts by an employee, during a specified period of time, less the pro-rated costs of the mobility system. Included on the cost side of the equation are the costs for system design, instruction of trainers, direct training costs, counseling, and selection/placement costs.

22/ This is the same model as that established for Ohio. However, detailed work has not been been conducted on implementing it at the Detroit Plant.

"Independently of the above approach, some evaluative data may emerge from a comparison of the performance of the experimental department(s) with other departments on a before/after basis. The psychological effect on employees from the introduction of the new system could have a substantial effect on their collective performance. If there is a substantial effect on department performance, it should stand out from the effects of all of the other, uncontrolled factors affecting the performance of a department."

At the present time, the Gear Division of the plant has agreed to participate in the R&D work. Details have not been finalized, but it is expected that all the Divisions' departments will be included and that counseling will be permitted. To what extent inter-departmental mobility will be allowed is awaiting resolution.

APPENDIX A

Highlights of 1971 - 1973 Collective Bargaining Agreement Between International Union and Midwest Corporation

Highlights of 1971 - 1973 Collective Bargaining Agreement Between International Union and Midwest Corporation

MEMBERSHIP: Employees must join the union on or before the fortieth day of employment as a condition of employment, except when prohibited by state law.

PROBATIONARY STATUS: New employees are considered as probationary employees for the first ninety days of employment. After ninety days, the employee is entered on the seniority list for his department.

TRANSFER BETWEEN PLANTS: An employee transferring to a new plant ranks in seniority according to his date of entry into the new plant - unless the transfer arises from a need for special skills or from the transfer of operations/departments.

RETURN TO HOURLY: An employee who is promoted to salaried and subsequently transferred to an hourly position will be credited with the seniority accumulated while salaried.

PROMOTIONS: "Promotions to higher paid jobs shall be based on seniority and ability to do the work."

TRANSFER WITHIN THE PLANT:

"1. Employees with one (1) or more years of seniority who wish to transfer to another department of the plant may make a single application in writing at the plant Employment Office. Employees will be furnished a copy of their applications.

"2. Such application (i) shall be valid for a period of six (6) months, (ii) may be renewed by the employee within ten (10) days of the end of each six (6) month period and (iii) may be revoked by the employee at any time provided, however, once the employee is

notified he is to transfer, the application may not be revoked.

"3. When hiring or transferring to fill open jobs in a department, the plant Employment Office will review and consider the applications of employees requesting transfer to that department that have been on file at least five (5) working days. Where reasonably practicable, employees will be transferred in order of their seniority. A job opening created by such transfer will not be filled by the transfer of another employee under this section. (Emphasis added)

"4. An employee transferred pursuant hereto may not make another application for one (1) year from the date of such transfer."

LAY-OFF: Probationary employees are laid-off first on a plant-wide basis. Seniority employees are laid-off in accordance with departmental seniority. Employees laid-off in a department have the right, within two weeks, of displacing employees with lesser seniority in other departments of a division. Employees can apply in writing, after two weeks to displace less senior employees in the plant; in this case, the employee must be recalled within 30 days, provided he has at least nine months more seniority than the employee he would displace.

RECALL: Employees are recalled according to departmental seniority. In addition, there are provisions for recall, within two weeks, by division seniority. An employee may apply for transfer to his old department in the event that he is recalled to another department, providing that such transfer does not require the transfer of another employee.

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Supplemental Provisions for Skilled Trades

APPRENTICESHIP QUALIFICATIONS: Apprentices are selected in accordance with the Uniform Apprenticeship Application and Selection Procedure:

- New hires must be 18-26 years of age, inclusive.
- Seniority employees must be between 18 and 45 years of age (the maximum can be extended one year for each year of military service, up to a maximum extension of three years).
- Must satisfy regular employment entry requirements and aptitude test requirement.
- If qualifications are equal, preference is given to seniority employees.

JOURNEYMAN: "The parties recognize that it is more desirable to secure journeymen by ... training through established apprentice training programs ..." Upon completion of the Apprenticeship training course, a man becomes a journeyman and is given a seniority date in each trade for which he became fully qualified during training. A journeyman in one trade who is working in another trade cannot exercise seniority rights against a journeyman in the other class until he has accumulated three years' experience. A journeyman cannot be laid-off while there is work he can do and temporary employees are retained. An apprentice cannot be laid-off while there are temporary employees retained in his trade.

APPENDIX B

A Proposed Cost/Benefit and Evaluation Model

Cost/Benefits to the Firm

The following model is derived for a single employee. The extension to groups is self-evident.

Costs

On the cost side of the equation we recognize:

1. System design costs
2. Curricula design costs
3. Instructor training costs
4. Direct employee training costs (for OJT) including wages and fringe benefits
5. Selection and placement costs (including counselling where relevant)

We propose that 1. through 2. should be amortized over a five year period and 3. over (say) a two-year period to give an allocable annual figure.

These costs will be computed on the basis of what has been or is being paid out for system and curricula design and instructor training, irrespective of the source of funding. It is obvious that to provide data relevant to other Midwest plants and other companies, the U.S. Department of Labor contribution should be tracked as part of the cost of development.

(Note that individuals promoted without reference to the system have a zero for these developmental costs 1. through 3. in their specific cost calculations. In the same way an individual receiving no formal OJT receives a zero against 4. Only 5. must carry some positive dollar figure, no matter what process of promotion is used.)

We define 4., the direct cost of employee training, as the sum of instructor wages and fringe benefits, trainee wages and fringe benefits and a machine/equipment cost factor, less the value added to raw material or semi-finished parts by the trainee during his training.

Since instructors in the proposed system will not be full-time, the instructor wage will be the sum of wages and fringe benefits paid while giving on-job instruction.

"Value added" is the value of the semi- or fully-finished parts produced by the trainee while undergoing OJT, less the value of the raw material or semi-finished parts he works on.

The cost of training a given trainee can be expressed as:

$$t_c = \frac{(a/5 + b/5 + c/2)}{\#\text{ of trainees in year}^*} + (d + e + f + g) - h$$

where:
- a = system design costs;
- b = curricula design costs;
- c = instructor training costs;
- d = instructor wages paid while instructing a given trainee;
- e = wages paid to that trainee while in training
- f = machine/equipment costs allocated to machine/equipment used by trainee - repairs, breakages, write-down, for the period of use by the trainee;
- g = fixed overheads such as space, heat, light, etc. allocated to trainee's operating area;
- h = value added by trainee to materials worked on during training.

Item 5., "selection and placing," includes the cost of recruiting if a vacancy is filled from the external labor market and of searching files to locate individuals of appropriate seniority and experience, interviewing them and providing the counselling which is part of the proposed system. This is essentially a replacement cost. For reference, the notation r_c will be used for this component.

Therefore, the cost of promoting an employee is expressed as the sum of t_c and r_c.

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* The number of trainees in the year in which the given trainee is trained. This can be estimated if necessary.

Benefits

The benefit side of the equation is defined as the net value of output from the employee after training is completed until some given time period, up to the time he ceases to occupy the job. (Net value, for this purpose, is the value added by his production operations less wages and fringe benefits and allocated fixed overheads during the time being considered.)

A benefit to cost ratio can be computed for various groups of employees who are promoted in the following ways:

a) entered the job from the "correct" lower level job and received no training under the new system;

b) entered the job from the "correct" lower level job and received training under the new system;

c) entered the job from a "non-correct" lower level job and received no training under the new system;

d) entered the job from a "non-correct" lower level job, or from outside, and received training under the new system.

Benefit to cost ratios can be computed for these groups for various periods of time (three months, one year, two years, etc.) and replacement costs included as incumbents move up or separate.

Measurements of Departmental Performance

Independently of the above approach, some broadly evaluative data may emerge from a comparison of performance data for the Wheel Cylinder and Master Brake Machining Departments before and after partial implementation and also between data from these two departments and other departments. The measurements will be the same as those described in the Introduction, which are continuously generated for departments. It cannot be expected that much effect will be observed from the improved performance of employees who have been selected according to the system; their performance will be diluted

by the performance of others who are present incumbents. However, some change in attitude and consequently performance of the entire group of workers might result from their awareness of the gradual introduction of the new system. (This awareness is bound to occur, as promoted individuals describe their counselling and training to their co-workers.) This psychological effect on the work force and its correlated improved performance is anticipated to be a sizeable component of the total impact of the system; it should not, therefore, be dismissed as being irrelevant to the purposes of evaluation.

In order to maximize this effect - and also to speed complete implementation - training will be given to new hires entering these two departments as Bench Hands. In addition, they will be counselled about their career opportunities. Heat Treatment Furnace and Rivet & Stitch Operators and Job Setters will also be promoted in these departments via the system where possible, in addition to the job classification already described, although it is unlikely that any promotions to the Job Setter classification will occur during the contract period. Individual performance, however, cannot be assessed for these jobs.

Data will be examined to see whether there is any change in the trends of the productivity and personnel performance measures in the experimental departments, when any seasonal effects are removed. Comparison will also be made with the comparable period of 1972. Comparison with other departments will be made, although care must be taken in interpreting such comparisons. To a limited degree, however, some other departments will be used as quasi-controls.

Some Limitations of the Experiment

It should be stressed that we see the evaluation design work and data collection conducted in the remaining months of the contract as a pilot or "dry run" operation, so that it is possible that the design described here will be modified during that period.

It is also recognized that intervening variables, such as changes in pay; shifts, foremen, the economic environment, may make interpretation of results difficult. This is particularly true of the departmental comparisons. Every

effort will be made to record all such changes, as well as any modifications in the system whose effects are being measured, so as to provide as clear an evaluation as the circumstances permit.

APPENDIX C

Skill and Knowledge Dimensions

Non-Knowledge Dimensions*

1. Locomotive
2. Object Placement
3. Object Manipulation
4. Guiding or Steering
5. Information Related
6. Human Interaction
7. Need for Co-worker Cooperation
8. Need for Leadership Skills
9. Decisions on Timing, Sequence or Speed
10. Decision on Methods
11. Choice over Standards of Performance or Output
12. Comprehension of Orally Transmitted Relevant Language
13. Spoken Use of a Relevant Language
14. Reading Use of a Relevant Language
15. Written Use of a Relevant Language
16. Financial Error Consequences
17. Error Consequence for Human Well Being

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* These dimensions and the associated rating scales and scale-point descriptors are those described in: Eleanor Gilpatrick and Irene Seifer, "A Re-Test Manual for Scaling Task Dimensions" (Working Paper #7), Draft, Health Services Mobility Study, January 1970. They have subsequently been revised by Dr. Gilpatrick and her colleagues.

Scale 18: Knowledge of Relationship Between Performers Input Action with Respect to Machine or Tool and Resultant Outputs

0. Performer performs no discretionary actions relating input and output of the machine or tool he operates

1. Performer performs a few discretionary actions in which one aspect of performer's input is paired with one aspect of output. Relationship is explicit. Required knowledge of intervening variables is zero.

2. Performer performs a few discretionary actions in which more than one aspect of performer's input is linked with one or more aspect of outputs, i.e., inputs are mixed to achieve a given output. Relationship(s) between performer's input and ouput is explicit. Required knowledge of intervening variables is zero.

3. Performer performs a few discretionary actions in which one or more aspect of performer's input is linked with one or more aspect of output, i.e., inputs may or may not be mixed to achieve a given output. Relationship(s) between performer's input and ouput is not explicit. A little knowledge of variables intervening between input and output is required.

4. Performer performs quite a wide range of discretionay actions in which one or more aspects of performer's input in linked with one or more aspects of output. Relationship(s) between input and output is not explicit. Required knowledge of intervening variables is quite high.

5. Performer performs a very wide range of discretionary actions in which one or more aspects of performer's input is linked with one or more aspects of output. Relationship(s) between input and output is not explicit. Required knowledge of intervening variables is very high.

Scale 19: Knowledge of Blueprints, (or Other Two Dimensional Representations of Three Dimensional Structures)

0. The performer utilizes (reads or draws) no blueprints, etc.

1. The performer utilizes blueprints, etc., which have only a few components and/or angles. No moving parts represented.

2. The performer utilizes blueprints, etc., which have quite a lot of components and/or angles. No moving parts represented.

3. The performer utilizes blueprints, etc., which may have quite a lot of components and/or angles and have only a few moving parts represented.

4. The performer utilizes blueprints, etc., which have many components and/or angles, but do not have more than a few moving parts represented.

5. The performer utilizes blueprints, etc., which have many components and/or angles and many moving parts represented.

Scale 20: Arithmetic Skill

0. No skill involved.

1. Add and subtract two-digit numbers. Multiply/divide 10's and 100's by 2, 3, 4, 5. Perform four basic arithmetic operations with coins as part of a dollar and common units such as cup, pint and quart; inch, foot and yard; ounce and pound (i.e., add and subtract).

2. Perform four basic arithmetic operations on all units of measure, common and decimal fractions, compute ratios and percentages. (Not using tables or slide rule or visual aids to computation, such as graphs.)

3. Compute such outcomes as discounts, interests, profit, commission, mark-up, selling price; surfaces, volumes weights. Compute roots and powers.

4. Perform No. 2 using tables or slide rule or visual aids to computation such as graphs.

5. Use practical algebra, geometric construction and essentials of trigonometry. (The theoretical knowledge level which is commensurate with this level of skill is as follows: functions - linear, quadratic, exponential, logarithmic, angle and circular and inverse; related algebraic solution of equations and inequalities; limits and continuity; deductive axiomatic geometry, plane and solid; ~~rectangular~~ coordinations.)

Scale 21: Skill in Using Small Hand-Held Tools

0. Performer uses no hand-held tools.

1. Performer uses simple hand-held tools which require no (or extremely crude) adjustment, little or no judgement as to which to use and little or no precision.

2. Performer uses simple hand-held tools which require no (or extremely crude) adjustment, little or no judgement as to which to use but some precision in their use.

3. Performer uses more complex hand-held tools which require moderately fine adjustment for their proper use in varying circumstances, and/or moderate judgement as to which to use, and some precision in their use and/or a great deal of precision in their use.

4. Performer uses more complex hand-held tools, which require very fine adjustment for their proper use in varying circumstances, and/or a great deal of judgement as to which to use and a great deal of precision in their use.

5. Performer uses more complex hand-held tools, which require very fine adjustment for their proper use in varying circumstances, and a great deal of judgement as to which to use and a great deal of precision in their use.

Scale 22: Bookkeeping/Accounting Skills

0. Uses no forms or keeps no records at all.

1. Enters data (dimensions, totals, etc.) on pre-printed forms in designated places. No data manipulation.

2. Transcribes (compiles) data from one or more forms or reports to one or more other forms or reports. Some data manipulation. (e.g., report preparation, summaries, recaps, etc.) mostly routine work. May use adding machines or desk calculators.

3. Same as 2 but larger degree of data manipulation; less routine, more judgemental. Tasks more complex. Some knowledge of elementary accounting principles (bookkeeping). Some analysis of data required. (e.g., allocation or categorization of data into accounting classifications, cost analysis, bookkeeping).

4. Much data analysis and manipulation. Generation of adjustments and journal entries. Knowledge of general accounting principles. Less routinized. More complex reports are prepared and/or reviewed for presentation to top management.

5. Top level analysis of financial data and judgemental decisions regarding materiality, internal control, confidence level, systems changes and reporting methods. Accounting theory and generally accepted accounting principles on all levels should be known. (Controller or Treasurer)

Scale 23: General Educational Development
Reasoning Development

1. Apply commonsense understanding to carry out simple one- or two-step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.

2. Apply commonsense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.

3. Apply commonsense understanding to carry out instructions furnished in written, oral or diagrammatic form. Deal with problems involving several concrete variables in or from standardized situations.

4. Apply principles of rational systems* to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.

5. Apply principles of logical or scientific thinking to define problems, collect data, establish facts and draw valid conclusions. Interpret an extensive variety of technical instructions in mathematical or diagrammatic form. Deal with several abstract and concrete variables.

6. Apply principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with nonverbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.

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* Examples of rational systems are: bookkeeping, internal combustion engines, electric wiring systems, house building nursing, farm management and navigation.

Scale 24: General Educational Development
Mathematical Development

1. Add and subtract two-digit numbers. Multiply and divide 10's and 100's by 2, 3, 4, 5. Perform the four basic arithmetic operations with coins as part of a dollar. Perform operations with units such as cup, pint and quart; inch, foot and yard; and ounce and pound.

2. Add, subtract, multiply and divide all units of measure. Perform the four operations with like common and decimal fractions. Compute ratio, rate and percent. Draw and interpret bar graphs. Perform arithmetic operations involving all American monetary units.

3. Compute discount, interest, profit and loss; commission, markup and selling price; ratio and proportion and percentage. Calculate surfaces, volumes, weights and measures.
   Algebra: Calculate variables and formulas; monomials with polynomials; ratio and proportion variables; and square roots and radicals.
   Geometry: Calculate plane and solid figures; circumference, area and volume. Understand kinds of angles and properties of pairs of angles.

4. Algebra: Deal with system of real numbers; linear, quadratic, rational, exponential, logarithmic, angle and circular functions, and inverse functions; related algebraic solution of equations and inequalities; limits and continuity and probability and statistical inference.
   Geometry: Deductive axiomatic geometry, plane and solid; and rectangular coordinates.
   Shop Math: Practical application of fractions, percentages, ratio and proportion, mensuration, logarithms, slide rule, practical algebra, geometric construction and essentials of trigonometry.

5. Algebra: Work with exponents and logarithms, linear equations, quadratic equations, mathematical induction and binomial theorem and permutations.

Calculus: Apply concepts of analytic geometry, differentiations and integration of algebraic functions with applications.
Statistics: Apply mathematical operations to frequency distributions, reliability and validity of tests, normal curve, analysis of variance, correlations techniques, chi-square application and sampling theory, and factor analysis.

6. Advanced Calculus: Work with limits, continuity, real number systems, mean value theorems, and implicit function theorems.
Modern Algebra: Apply fundamental concepts of theories of groups, rings and fields. Work with differential equations, linear algebra, infinite series, advanced operations methods and functions of real and complex variables.
Statistics: Work with mathematical statistics, mathematical probability and applications, experimental design, statistical inference and econometrics.

Scale 25: General Educational Development
Language Development

1. Reading: Recognize meaning of 2,500 (two- or three-syllable) words. Read at rate of 95-120 words per minute. Compare similarities and differences between words and between series of numbers.
   Writing: Print simple sentences containing subject, verb and object, and series of numbers, names and addresses.
   Speaking: Speak simple sentences, using normal word order and present and past tense.

2. Reading: Passive vocabulary of 5,000-6,000 words. Read at rate of 190-215 words per minute. Read adventure stores and comic books, looking up unfamiliar words in dictionary for meaning, spelling and pronunciation. Read instructions for assembling model cars and airplanes.
   Writing: Write compound and complex sentences, using cursive style, proper end punctuation and employing adjectives and adverbs.
   Speaking: Speak clearly and distinctly with appropriate pauses and emphasis, correct pronunciation, variations in word order, using present, perfect and future tenses.

3. Reading: Read a variety of novels, magazines, atlases and encyclopedias. Read safety rules, instructions in the use and maintenance of shop tools and equipment, and methods and procedures in mechanical drawing and layout work.
   Writing: Write reports and essays with proper format, punctuation, spelling and grammar, using all parts of speech.
   Speaking: Speak before an audience with poise, voice control and confidence, using correct English and well-modulated voice.

4. Reading: Read novels, poems, newspapers, periodicals, journals, manuals, dictionaries, thesauruses and encyclopedias.
   Writing: Prepare business letters, expositions, summaries and reports, using prescribed format and conforming to all rules of punctuation, grammar, diction and style.

Speaking: Participate in panel discussions, dramatizations and debates. Speak extemporaneously on a variety of subjects.

5. Reading: Read literature, book and play reviews, scientific and technical journals, abstracts, financial reports and legal documents.
   Writing: Write novels, plays, editorials, journals, speeches, manuals, critiques, poetry and songs.
   Speaking: Conversant in the theory, principles and methods of effective and persuasive speaking, voice and diction, phonetics and discussion and debate.

6. Same as Level 5.