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**MANPOWER DEVELOPMENT FOR THE
URBAN WATER SUPPLY SECTOR
INDONESIA**

MANPOWER CLASSIFICATION SYSTEM

DRAFT PROPOSALS - APRIL 1981

The draft manpower classification system results from the joint work of Mr. R. Cook (project leader), the short term specialist manpower planning adviser, Mr. P. Bixby, and officials of the national manpower development programme.

Jakarta, April 1981

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Manpower Classification System.

Synopsis.

It is considered to be of the utmost importance to develop a manpower classification system to be used within the water supply sector of Indonesia.

The manpower classification system is to provide a basis from which systematic recruitment and training can be undertaken to ensure that the skills knowledge and behaviours needed for the efficient and effective functioning of the enterprises are available when needed.

To establish the basis for the manpower classification system, it is necessary to identify all functions to be completed by the enterprise, and to develop organisational structures to effectively and efficiently carry out the functions.

The required functions are divided into tasks which can be undertaken by individuals within the organisation, and the necessary skills and knowledge required to carry out the work can be identified. The tasks are grouped to form jobs, the jobs then being detailed based on the principle of minimising educational/professional skill requirements consistent with the effective and efficient functioning of the enterprise, and the overall manpower supply position in Indonesia

The jobs are arranged to provide easily seen career development opportunities for each grade. Remuneration should accordingly be made commensurate with the requirement for skills, knowledge and responsibility attached to the job. Succession planning is necessary to ensure that as far as possible, internal promotions are established.

Promotion should be based on ability, and not related specifically to academic qualifications. As far as practical, all persons should be employed so as to fully utilise their abilities. Promotion should be possible to the maximum level at which the person can work efficiently and effectively. Conversely, people should not be employed to carry out work for which they are more than marginally overqualified.

Supervisory functions must be clearly defined, and the persons undertaking this work should be recruited based on having the characteristics necessary for successful supervision. Training for supervisors should be directed specifically toward developing the skills and knowledge of the supervisory process.

For small water enterprises, it is uneconomical both in terms of manpower and equipment for staff to be employed on a permanent basis to undertake specialist tasks which are only required infrequently. Additionally, experience would not be obtained by the specialist staff who would be using their skills infrequently. Such specialist services must be obtained by the water enterprise either by contract or by the use of personnel and equipment from a larger water enterprise that has the need of the specialist services on a continuous basis, and therefore have staff well experienced in the specialised skills.

Larger water enterprises who have the requirement to employ specialist staff should be able to provide specialist services to smaller enterprises as and when required. The larger organisations will provide additional career advancement opportunities for all staff.

A good performance appraisal system must be established to facilitate internal promotion, particularly for supervisors, and to identify and plan for succession.

In the manpower classification system each position in the water enterprise is identified; given a title; the duties and tasks to be performed; the knowledge and skills required to undertake the duties efficiently; and detail of information that may be useful. The knowledge and skills possessed by the job holder can then be assessed, and the job holders' specific training requirements detailed, being the difference between the skills possessed and what is needed.

The manpower classification system will apply to any organisation responsible for providing potable water.

Using the required skills, knowledge and responsibility required for each position in the water enterprise, a grading structure can be developed to determine the grading of each job relative to other jobs in the enterprise, so as to give an indication of relative remuneration levels.

Organisational structures can then be developed based on the work requirements of the specific enterprise, in terms of treatment processes undertaken by the enterprise, distribution system, expansion plans and overall size of the enterprise.

The organisational structures will detail the number of persons required to undertake the work, and the job descriptions will indicate the required level of personnel in terms of knowledge and skills required.

The manpower requirements to meet the work requirements can then be obtained both in terms of current needs, and in terms of future requirements due to staff movements (retirements, wastage, etc.) and expansion, including the establishment of new enterprises.

The present proposals cover all junior staff required by water enterprises, the term of junior staff being applied to those staff who are generally concerned with mainly routine work.

1. FACTORS TO CONSIDER IN DEVELOPING A MANPOWER CLASSIFICATION SYSTEM

1.1 INTRODUCTION

Before and since arriving in Indonesia, the considered importance of the Manpower Classification System as a starting point for manpower planning in general and for the development of training programmes in particular has been impressed on the manpower consultant. The phrase manpower classification system is frequently referred to in the Milburn/Vincent report of 1979, the Milburn progress report (1980), the report of the interim project manager (1980) and the D.H.V. phase 1 report (1980).

However important the M.C.S. might be to manpower development within the Indonesian Water Supply Sector, the term has never been operationally defined. As a first crucial step then, the term M.C.S. is defined in such a way that appropriate actions can be taken to develop such a system.

"A manpower classification system identifies the functions, tasks and activities which must be carried out in a Water Enterprise and provides the basis from which systematic recruitment and training can be undertaken to ensure that the skills, knowledge and behaviours needed for the efficient and effective functioning of the enterprise are available when needed."

The second important step is to classify jobs rather than manpower. Only after jobs have been identified and defined is it possible to diagnose the skill, knowledge and behavioral requirements and then finally to set out the educational/professional qualifications likely to predict success in their acquisition, given the availability of suitable training programmes.

In the case of highest level managerial and specialist jobs of course, professional and vocational qualifications are important indicators of existing capabilities. (e.g. a qualified sanitary engineer).

To begin developing the M.C.S. it has been necessary to answer such questions as:

"What functions have to be performed in an effectively functioning independent Water Enterprise?"

"What activities must take place within each function?"

etc.....

It is clearly necessary to set out with an analysis of what should happen within a W.E. rather than what is taking place in existing W.E.'s

Once the M.C.S. is established on this basis, it then becomes possible to.

- (a) Identify any discrepancies between the ways in which jobs are defined and performed in existing W.E.'s on one hand and the situation which should exist on the other. Corrective action can then be taken as needed through recruitment, reorganization, training and retraining.
- (b) Ensure that new or rapidly developing W.E.'s are able to develop effectively in manpower terms from the outset.

Any attempt at developing a M.C.S. from an analysis of existing Water Enterprise organization, manpower systems and operational practices would carry with it the risk of building any existing weaknesses into new W.E.'s and reinforce existing inefficiencies in established W.E.'s

To this extent, the manpower consultant has had to go back to the beginning since much of the work completed to date has focussed on conditions within existing W.E.s.

1.2 OTHER CONSIDERATIONS

1.2.1. GRADING STRUCTURE

It is apparent that at the present time there is no real grading structure within Water Enterprises. In making best use of its human resources and in the process of planning its own growth and development, it will be necessary for each W.E. to provide a meaningful career structure for employees. Planning for human resource development is only possible on a systematic basis once it is known how each job within a function of the W.E. relates to the jobs above it and below it. Continued motivation of employees will also depend on establishing a salary structure which takes responsibility into account within and between functions. Any grading system should concern itself primarily within the needs of the W.E. In particular it should provide proper supervisory and managerial controls throughout each

function. Establishing a grading structure represents a very important framework within which career opportunities can be made available for those employees with the potential to take on more responsibility. It is possible to use the M.C.S. to develop such a structure and proposals are put forward later in this report.

1.2.2. SPECIALIST MANPOWER

Differences in level of complexity between W.E.'s will mean variations in demand for specialist manpower.

For normal operational activities, training programmes have been or are being designed as the basis for providing such people. Even with the more complex technical systems (e.g. treatment processes, treatment plants, water testing facilities), the quality and enthusiasm of staff recruited so far suggests there should be few problems in developing the basic operational skills and knowledge. Whether recruitment of staff of the right quality becomes more difficult as the number required increases sharply over the next few years, will depend very much on the way tasks have been put together to form whole jobs. Division of labour can be achieved in several ways. It would be possible for example to train a high ability person to take full responsibility for the operation, maintenance, fault diagnosis and repairs to a full water treatment plant. To achieve this would require an extensive and lengthy training programme and probably a period of planned experience in another W.E. before the individual could be considered ready.

The extreme alternative would be to divide up the total requirement into a large set of routine and simple tasks, each of which could be undertaken with little training or experience. But in this case the level of supervisory skill would need to be high.

The most satisfactory approach in Indonesia given the manpower situation as a whole and the rapid growth determined manpower requirements of the water sector, is likely to fall somewhere between these two extremes. The solution is one in which:

- (a) Present and future W.E. operational needs can be satisfied through relatively short training experiences

- (b) These basic operational skills/knowledge can be built on by providing further planned training experience both within the W.E. and through the facilities of MDP.
- (c) The jobs are not so simple that only low ability people are recruited. This approach would require too many people and would make it difficult for the W.E. to build up its pool of skills to operate an effective career structure.

The manpower classification system is aimed at this intermediate approach because it would seem to best meet the immediate and longer term needs of the Indonesian Urban Water Supply Sector.

There is also a question to be raised on the organisation best suited to making available to W.E.'s those specialised resources which will be needed from time to time but when full time employment (particularly in the smaller W.E.'s), could not be justified either economically or in terms of the misuse of scarce and highly skilled manpower which it would represent.

Such specialists would include chemists and bacteriologists (capable of carrying out complete laboratory based analyses of water samples), highly trained staff for repairs to meters, pumps, waters, electronic equipment etc. and design engineers (e.g. for reservoirs).

The above list is by no means a complete one. However, at this stage it is clear that many specialists will be in increasingly short supply as the momentum in W.E. development builds up over the next 2-3 years. Even if such people can be recruited in sufficient numbers with appropriate educational qualifications they would in many cases still need extensive training and experience.

There are several ways in which the problem can be tackled:

1) Development of existing W.E. technical staff

Much has been said concerning the most appropriate educational qualifications for newly recruited staff. The general conclusion is that recruitment should not take place at educational levels in excess of those required for successful completion of initial training and effective job performance.

Although that is the correct approach in general (and the case is argued in this paper), and is necessary to meet the lower level operational demands which are rapidly increasing, sight should not be lost of the need to plan for the longer term.

The long term success of any business enterprise depends on the ability of the enterprise to develop its own people. This implies that the potential for development exists. The recruitment policy should therefore be one which makes minimum demands on entry qualifications (because adequate training will be given), but should be reasonably selective in the range of abilities. Some highly able, lower level recruits will be needed, people who can be quickly taught an operational job but who can also be systematically developed for one or another of the many specialised roles. Equally, each water enterprise will need to recruit considerably larger numbers at lower ability levels, people who are trained to do a job well and who expect only limited career opportunities. To recruit only highly able people would create a great deal of frustration in the longer-term. The balance is important for the health of the enterprise.

2) Provincial Service Units

The proposal put forward in 1) is a partial solution to the development of high levels of skill and knowledge within W.E.'s. It is also longer-term and there are some limits to its value for the next few years. Such internal recruitment should be considered as a key objective for the period following REPELITA III. To achieve such an objective will require that programmes of training and planned experience to develop able people beyond the first stage of operational skills be prepared within the next 12 months. The MDP together with the Provincial Development Assistants should play a vital role in the design and coordination of these later developments.

As an alternative, it is possible to establish Provincial Centres. Each Centre would have the full range of specialist facilities and staff, capable of providing all specialist services to W.E.'s within the Province. Logically, the centre would be located in and be an integral part of the P.D.A.M of the Ibu Kota Propinsi.

Its primary responsibility would be to the PDAM in which it is located, but its resources both technical and manpower, should be sufficient to ensure that all facilities and services are available to every W.E. in the Province. Some services will be needed on a regular basis and can be planned for to ensure full use of resources. Other services will have to be provided on an as needed basis.

Although referred to as Provincial Service Units, the name is a reference to their function within the Province. It is not intended to suggest a physically separated entity.

The advantages of such a Provincial organisation would be many.

They include:

1. Concentration of available financial resources on the development of Provincial Service Units would represent the most cost effective use of those resources for plant, equipment, machinery and highly qualified manpower.
2. It would promote the development of high levels of competence which would not be at all easy if the same manpower resources were distributed among many Water Enterprises. The bringing together of a number of highly qualified staff into a Provincial Team would encourage the further development of knowledge of the water industry both Provincially and nationally as it applies to the Indonesian situation.
3. It would make available to each W.E. within the Province, a range of highly specialised and experienced services.
4. It would make possible the effective full-time use of able people whose employment would be difficult to justify in any other way and whose motivation and capability can be maintained and developed in a well-resourced, professional environment.
5. Such units could provide an excellent training ground for certain specialised skills needed on-site in all or at least some of the other W.E.'s within the Province. There could be an important role here for the Provincial Development Assistants. One of the advantages of such an approach is that the Provincial Service Unit would be identified as a "centre of excellence" for the province, setting and maintaining high standards for key activities in all W.E.'s.
6. They would provide a basis for much more effectively monitoring standards and for ensuring the effective implementation of policy regarding the provision of potable water to the Urban population. It is not suggested here that the Provincial Service Unit should have any formal authority or control over other W.E.'s. Rather that through its conduct and demonstrated capability it influences all W.E.'s.

It is appreciated that the legal framework within which W.E.'s are established and function, together with the somewhat complex distribution of responsibilities may make the implementation of such a structure difficult. It is for the those Indonesian Authorities concerned with the sector to determine whether such an arrangement is sufficiently attractive to stimulate the changes in legislation which would make it a realistic possibility.

A further practical, but not insurmountable problem would be that since each PDAM is expected to be self-financing (including future development), the PDAM in the Ibu Kota Propinsi could not be expected to finance services which it is providing for other W.E.'s (PDAM and BPAM in particular). Some mechanism would need to be found for costing and charging out to each W.E., for those services which it uses, on a non-profit making basis. However, the independent status of each PDAM might at the same time influence them not to use external facilities for which they have to pay until a situation develops when it becomes inevitable.

Such problem would be very much easier to resolve within the framework of a comprehensive Indonesian Water Act. Even without such an act it should be possible to establish some form of Provincial organization within the framework for example of the Provincial Project Offices.

3) A Shared Specialization Approach.

This is a variation on 2) above. Again it provides a full support system within each Province, but responsibility for maintenance and provision of specialized resources is shared between the larger PDAM's in the Province

As an approach to effective utilisation of resources, it is not as unusual as it may seem. It does for example form the basis of operation of Regional Forensic Science laboratories in the U.K. Each laboratory is responsible for providing a complete scientific service to the police forces in it's region. For much routine work (e.g. finger printing, blood-sample testing) each is able to work from its own resources and facilities. For more specialized work, each laboratory has highly qualified and experienced staff for one major area of investigation. Each of these major facilities is made available on a national scale through requests for assistance from the appropriate regional laboratory. One for example specialises in firearms another in drugs. In addition to providing the specialized service, each conducts research as the basis for developing that service.

A similar situation could be envisaged in the Indonesian Provincial Water Supply organization. Each W.E. (whether PAM, PDAM, BPAM etc.) would have the basic support facilities necessary for operational efficiency (e.g. routine servicing, simple repairs, comparator test equipment etc). For more sophisticated or complex facilities each W.E. would request a particular service from the P.D.A.M. specialising in providing it.

Advantages of this approach would include many of those listed for 2) above, namely: 1,2,3,4,5.

Difficulties would also be much the same as those set out under 2) above. In addition, the integration, coordination and accounting management would be more complex.

Developing staff (as in 1) above) should be regarded as an ongoing feature of development within each W.E. It is the opinion of the manpower planning consultant that serious consideration should be given to some form of Province-based professional and specialist service organization. In the long-term, such an organization can only be of benefit to the development of high levels of expertise within the sector and will provide the kind of framework needed for providing a range of high quality services in the most cost-effective way.

Of the two alternative forms of organization set out above, it is recommended that 2 be given priority.

A list of services and facilities which might be included in a specialist Provincial unit is as follows.

1. Fully equipped and staffed laboratory for detailed water analysis (bacteriological and chemical). Possibly also including research facilities.
2. Fully equipped workshops for major servicing, overhaul and repairs to-pumps
 - meters
 - electric motors
 - Diesel engines
 - Valves
 - Electrical control equipment
 - Electronic control equipment
 - Vehicles
 - Plant
3. Workshops to include mobile units to undertake on-site servicing/repairs where this would be the most convenient and/or cost-effective.

4. A provincial store for major items and with an effective stock control system. It would also be cost-advantageous for the provincial stores to be responsible for bulk buying of items routinely needed by all W.E.'s within the province.
5. Plant which can be made available on an as needed basis to W.E.'s within the province, especially plant which cannot be hired on a cost-effective basis locally.

The existence of such Provincial units would place increased demands on management. Management of the units themselves would require considerable decision-making and priority allocation skills. In addition, the relationship between the unit and W.E.'s in the Province would demand a high level of cooperation and effective communication.

On the plus side, the more effective use of highly skilled manpower would reduce the total number of people who would otherwise have to be recruited and trained.

1.2.3. TECHNICAL EMPHASIS

For two reasons, the M.C.S. places an emphasis on the production and distribution functions. Firstly because administration and finance organization and preferred procedures are well documented. Training needs for these areas have already been to a considerable extent identified. What is more, Indonesian consultants have already been involved in the design and implementation of training courses and have a comprehensive knowledge of the systems used.

Secondly, the technical functions have received nowhere near the same degree of attention when the manpower consultant arrived in Jakarta, few technical roles had been defined with adequate job descriptions to aid recruitment, training and retraining (in existing W.E.'s) on a planned national basis.

Yet there is now and will be for some years to come, an urgent need to provide competent staff for technical departments and these will be needed in significant numbers.

Thus the focus on technical manpower resourcing reflects present realities rather than a devaluation of the important roles within administration and finance functions.

1.2.4. SUPERVISORY ROLES

Considerable mention is made within the M.C.S. of supervisors. Discussions with a number of people make it apparent that the nature of the supervisory role, the concept of supervision and its importance to the efficient functioning of a Water Enterprise needs clarification.

A further reason for singling the role out for particular attention in this introduction is based on observations within existing W.E.'s and discussions with consultants and others involved with current developments. Taking the second point first, the actual operational role behaviours of many people in many existing W.E.'s show considerable deficiencies. The problem in many instances is not that staff are unaware of what they should be doing. In spite of understanding what should be done however, many important tasks are simply not carried out.

The failure to carry out procedures and routines is apparant in many of the technical operations areas. Some illustrations to make the point clearer are listed below:

1. Badly maintained treatment plant, including cases when the filter medium should have been changed years ago because of infrequent back-washing. The attitude seems to be-"if it produces a reasonable quality water, leave it alone".
2. Chemicals mixed on a guess work basis. Explained away as an approach which works because it is based on experience. Yet often the dosage levels are inadequate.
3. Flow-meters which have been unserviceable for months or in some cases, years.
4. Unservicable equipment.
5. Large numbers of consumers' meters out of action and no systematic reporting of these. In some W.E.'s, the proportion is very high indeed.

These and numerous other examples indicate a failure to recognise the importance of attention to detail and the importance to any continuous flow system of the application of routine monitoring, checking and servicing on a regular and systematic basis.

If the existing malpractices are accepted as normal for new W.E.s it is likely that few would be able to determine whether or not they were meeting the self-financing objective as set out in Buku-Pedoman because there would be insufficient accurate data available. More important from a practical point of view would be the severe restrictions such organizational weaknesses would place on growth expectations.

With the background illustrated above it is clear that operational emphasis must be placed on performance monitoring and control systems. The most critical of these is the development and use of effective supervision.

To return to the concept of supervision as it applies to W.E.'s in Indonesia.

It is the process of monitoring and controlling the task performance of all operations personnel to ensure that all tasks are performed within the framework of systems, procedure and performance standards laid down for the Water Enterprise.

The most important role in the process is that of the supervisor. He is the person with direct responsibility for ensuring that the above conditions are met.

Meeting that responsibility requires some clear actions on the part of the supervisor.

- He should:
- Make sure that work objectives are clearly understood
 - Give clear task instructions and make sure they are fully understood.
 - Make sure that people are fully aware of the procedures and practices applicable to each of their jobs
 - Set acceptable performance standards and make sure these are met.
 - Ensure that problems which result from inadequate training are notified to management so that action can be taken.
 - Take action when Job behaviour does not meet accepted standards.

Training for supervisors should be directed specifically toward developing skills and knowledge of the supervisory process as set out above.

Selection of people for supervisory roles should be very carefully carried out. Because the supervisor has considerable responsibility, it will be seen from the grading system established by the M.C.S., that the role represents a line of promotion within the W.E.'s.

In line with the proposal put forward earlier that promotion should be from within the organization, it is anticipated that the majority of supervisors will be recruited from existing personnel in established W.E.'s.

Such people should be recruited on the basis of the following characteristics, all of which are important in successful supervision.

- A complete technical knowledge and a high level of experience of those jobs for which they will be supervising others.
- A high level of self-discipline and willingness to accept standard procedures and practices as demonstrated through their own job performance.
- The ability to communicate effectively with other people
- The ability to command the respect of staff for whom they have responsibility.

The majority of supervisors should therefore be those people who are skilled, high-performers in their present jobs, together with the social skills which are necessary as the basis for influencing others. The supervisor should lead by example.

The grading system put forward later also shows the reporting relationships between supervision and management. These links are an important part of the management communications system and managers should give full support to supervisors to ensure that the supervisors' authority in dealing with his staff is real and effective.

In newly developed enterprises in particular, it is likely to be the case in the early days that the supervisory role will be combined with a practical working role. In such cases it might be expected that the best performer in a work group would take on the additional supervisory responsibilities. At a very early stage, liaison with training staff should provide useful indications as to who these people might be. They could then be singled out and given additional training.

The same situation might also sometimes exist in some sections of smaller W.E.'s, where effective supervision will be needed but when the full-time use of a highly-skilled person on "non-productive" work could not be justified.

1.2.5. MANAGERIAL ROLES

The M.C.S. will have its most significant immediate impact in recruitment of and training activities for technical operations personnel.

The ability of each W.E. to achieve its business objectives will however depend heavily on the quality and performance of its management team.

A basic understanding of the management process, higher level technical, administrative and financial knowledge, and a clear understanding of the aims and responsibilities of a Water Enterprise should be sufficient to provide an effective management team during the operational start-up phase.

Referring again to observations and experience of existing W.E.'s, it must inevitably be concluded that the deficiencies which exist at junior levels are ultimately the responsibility of management. Whereas junior staff performance weaknesses seemed in many cases due to lack of motivation and long-established bad habits and not so much due to lack of skills or knowledge, with managers the situation was somewhat different.

In many instances discussion showed that managers and sometimes senior managers, lacked the professional managerial skills needed for effective managerial performance.

Full analysis of manager development needs will therefore be very important. The senior management team in particular will need to develop considerable competence in such areas as:

- Planning
- The nature of business
- Identifying organization strengths and weaknesses
- Coordination of functional activities
- Decision-making
- Applications of management-information systems.

This cannot all be achieved immediately, and in any event should not be undertaken until a clearer picture of more precise Water Enterprise management needs is obtained.

For the future though it can reasonably be predicted that if managerial performance is not developed, then many existing W.E.'s will not achieve growth targets once the management team assumes full responsibility. The main reason for this is that management at present has an orientation forward maintaining the status quo rather than growth.

1.2.6. THE ROLE OF M.D.P.

Since one of the main purposes of the M.C.S. is to establish a national training programme, for which the MDP and its staff have considerable responsibility, it would be quite wrong for the development needs of M.D.P. itself to be ignored.

However since proposals for such development are a product of conclusions from the M.C.S., they will be the subject of a separate document.

1.2.7. PERFORMANCE APPRAISAL

For the MCS to have benefits which will be available throughout the decade and beyond, it is important to establish effective personnel systems within each Water Enterprise. One of the most important is a performance appraisal system which can be used by those who have staff responsibilities and is acceptable to those who are affected by its use.

Indeed, it is not just the MCS and the grading structure proposed within it which makes the development of an appraisal system of paramount importance. It is just as important to the success of manpower planning and to satisfying the principle of development and promotion from within as set out earlier in this report.

What will have to be determined is the nature of an appraisal system which is suited to the needs of W.E.'s in Indonesia. This will have to recognize and take into account the opportunities and constraints which exist in W.E.'s, the sector and any national regulations which affect career structures. Following the development of the system it will then be necessary to develop procedures for its implementation at W.E. level. These will include.

1. Establishing the means of monitoring and when possible, measuring individual performance, and performance improvement. This will have to be done through the managerial and supervisory structure.

2. Designing administrative support procedures. These will include documentation and procedures for evaluating and actioning the outcome of individual performance appraisal.
3. Training W.E. staff who will have responsibility for the performance appraisal of subordinates to include explaining the purpose of the system, use of administrative procedures and for managers, it should also include training for conducting performance appraisal interviews.

1.2.8. WHAT IS AN APPRAISAL SYSTEM?

It is important to clarify what is intended in the context of the Indonesian Water Sector so that the confusion and misuse which often accompanies the introduction of such a system can be avoided.

It is a system for the planned identification of individual potential and training or development needs, through the process of systematically monitoring individual job performance characteristics in relation to present job needs and future manpower requirements.

As such, it is not an alternative to the normal day to day line managers or supervisors responsibility for achieving effective work performance.

A good performance appraisal system can be seen to fit into the overall manpower planning process at W.E. level as shown on the diagram overleaf.

1.2.9. SUCCESSION PLANNING

If it is the intention that recruitment of staff should where possible take place through internal promotions, then for senior posts in particular, there should be a succession plan.

In practice this means that the replacement of key personnel should be planned for, by identifying suitable candidates employed by the W.E. For effective succession planning, it will be necessary to determine how long it would take before a candidate can be regarded as ready to take over should the need arise and to establish a programme of formal development and work experience to ensure that time-scales are met.

It is usually the case in large organisations with many operating units that senior posts are advertised widely so that any suitably qualified and experienced person from within the organisation can apply.

It is appreciated that at the present time there are difficulties in the way of making opportunities available to employees who do not work for the W.E. in which they occur.

However for the most effective use of highly qualified manpower on a national basis, it is urged that serious consideration be given to creating conditions where this becomes possible.

If there is restricted movement of labour from one W.E. to another, serious difficulties are likely to be created for the future.

1. High quality staff might be reluctant to join the water sector if limited promotion opportunities exist.
2. To restrict promotion to within the single W.E. would lead to limited use of the abilities and potential of the more able employees, particularly in the smaller W.E.'s

The problem will of course be most severe for those people at senior levels who have already reached the more senior positions and for whom further promotion can only come from moving to a larger W.E.

2. MANPOWER CLASSIFICATION SYSTEM (MCS) FOR URBAN WATER SUPPLY SECTOR-
INDONESIA.

2.1. INTRODUCTION:

The rapid development of any sector can be facilitated by a system which identifies in an unambiguous way, the jobs which need to be carried out and the types of people needed to carry them out. The MCS represents the basis for a coherent sector wide recruitment and training/development programme.

Given the rapid growth rate within the water sector, careful consideration must be given to the ideal relationship between the operation and growth requirements of the Water Enterprises (W.E.'s) on the one hand and the skills, knowledge, qualifications and experience characteristics of the employees who have to satisfy those operational and growth requirements on the other

The ideal relationship is that in which the effective functioning of the W.E. is achieved at the lowest possible manpower costs. Another way of expressing the issue is that for all jobs and at all levels in the W.E. there is a need to identify the minimum skills, qualifications etc. consistent with effective job performance. This is particularly important in a situation where there are likely to be competing demands for highly qualified manpower from other sectors.

The water supply sector presents considerable advantages in this respect. First, any W.E., whatever its size and technical complexity, has to carry out the same functions. Secondly, within each function it is possible to identify and define specific jobs quite clearly. These too display considerable consistency between W.E.'s regardless of size and complexity. Thirdly, since it is likely that the majority of personnel for each W.E. will be recruited locally, it is necessary to acknowledge probable limitations on the availability of highly qualified manpower in some Cities and the more ready availability of semi-skilled and unskilled labour.

Limitations on local manpower availability as described above together with the low level of labour mobility apparent in Indonesia (except possibly at more senior levels), makes it even more important to classify manpower in such a manner that the best possible use can be made of what is available.

Such limitations also present opportunities. In any effective organization manpower development takes place from within. i.e. the organization is structured in such a way that it can continue developing its employees to make greater contributions and maintains employee motivation as well as organizational efficiency/effectiveness by offering career opportunities. Thus the aim should always be to promote from within. External recruitment should normally only take place at the lower levels in the organization in order to replace people who have been promoted or retired.

In most cases, W.E.'s will be growing quickly, with demands for the recruitment of additional staff. Again these should be recruited at lower levels (where the greatest expansion will be in any case). Clear exceptions to the general rule will exist from time to time. At various stages of growth it will become cost/effective to employ full-time specialist skills as an alternative to using specialist skills provided by a larger W.E. or by some central agency (e.g. Provincial or Regional).

Yet another consideration is whether in practice a W.E. should buy-in skills on a temporary basis when full-time employment cannot be justified. This is more likely to need deciding under one-off circumstances (e.g. during a short-term but extensive expansion or renewal activity).

Whatever specific circumstance-based decisions are made within any W.E. with regard to manpower recruitment and development, the M.C.S. will provide the basis from which its requirements can be determined.

2.2. THE ADVANTAGES AND DISADVANTAGES OF A MANPOWER CLASSIFICATIONS SYSTEM

2.2.1. ADVANTAGES

An effective M.C.S. offers several advantages to any sector at an early stage of rapid expansion. The more important of these are:

1. It provides the basis for a standardised approach to the recruitment and development of staff.
2. It will indicate the levels of education/experience ideally required at each job level.
3. Importantly at sectoral level, it provides the basis from which training/development needs can be more clearly identified and programmes designed to meet those needs in a more systematic and more effectively controlled way.
4. It represents the starting point for the development of sectoral manpower plan from which present and future manpower needs can be identified and appropriate actions to meet those needs taken.
5. It is a useful starting point for the design of organization structures appropriate to the aims of enterprises within the sector and the needs of employees.

With the particular characteristics of the Indonesian Water Supply Sector in mind, there are additional benefits to be obtained from a manpower classification system and which should perhaps be pointed out here. They are:

1. The geography of the country and the large size of Indonesia as a whole, requires the establishment of many independently functioning water enterprises in order to meet the needs of the urban population for potable water under Repelita III and beyond. The considerable range of types of water enterprise (in terms of size, water sources, sophistication of treatment plant etc), also interacts with the decentralised character of the sector to produce a situation in which there is a clear need to provide central influence and guidance. A manpower classification system offers just one mechanism through which an integrated and systematic sectoral growth can be more effectively achieved.

2. A number of consulting companies and development agencies are currently involved in numerous projects designed to meet the objectives of Repelita III. The urgent need to commission W.E.'s has inevitably led to staff recruitment and training inputs designed to meet the requirements of water enterprise operation (for example the DHV crash training programme).

Such programmes are essential at the present time and many will no doubt find their way into the training schedules ultimately developed for a National training programme. However it is acknowledged that there is an over-riding need to look at the sector as a whole rather than make assumptions about national recruitment/training activities from experience with a relatively small number of W.E.'s. A national sectoral M.C.S. will therefore be of value not only to those responsible for managing W.E.'s but also to consultants involved in the development of W.E.'s

3. The important and rapidly growing need to design appropriate training programmes for staff at all levels and to determine the numbers requiring such inputs at different levels, can largely be met through the Manpower Classification System.
4. Involvement in the processes and activities which lead to the formulation and implementation of the M.C.S. will provide important development experience to those people within the sector who will in the future be regarded as specialists in the field of manpower planning/development/training and who will provide a vitally important advisory service to the W.E.'s .

In particular this applies to the staff of M.D.P. and to the development Assistants formerly referred to in the Milburn/Vincent report as Regional Manpower Development Officers. It is on the competence of such people that optimum manpower decisions will be made in the future at provincial, regional and local W.E. levels.

5. Finally but by no means less important is the development of the MDP itself as a fully functioning central manpower advisory unit. Achieving this status, not just formally, but gaining recognition as a high credibility source of information and ideas on a wide range of manpower related issues.

In this respect the M.C.S. will contribute toward a clearer understanding of medium and longer term staffing requirements and of the need for and direction of specialisation within M.D.P.

Having set out the key advantages both generally and as they apply to the particular circumstances of the Indonesian Water Supply Sector, it is perhaps useful to mention potential problem areas.

2.2.2. DISADVANTAGES

1. Although a classification method is sometimes employed as the basis for determining wage and salary levels, it is not necessarily regarded as the most effective. Manpower Classification should not therefor be assumed synonymous with Job Evaluation. Although a sectoral Manpower Classification system will provide guidelines for a grading structure, it will not provide the detailed job by job comparisons of skill and knowledge levels considered desirable for the formulation of an equitable wages and salaries system. Many more sophisticated statistical and analytical methods specific to this purpose are available.

Having sounded that note of caution, it is essential for staff recruitment, motivation and retention that realistic wage and salary structures exists. This is one which recognises and rewards skills, knowledge, performance and levels of responsibility in a consistent and acceptable way.

It should also be a structure based throughout the salary range on realistic comparisons with other sectors making competing demands on similar manpower within Indonesia.

2. Any system of standardization or classification can be applied too rigidly. The M.C.S. developed here, is intended to assist W.E.'s in the process of manpower planning and decision-making. As such, it is based on an assessment of the experiences so far available within the Indonesian water supply sector (operational and developmental) together with the knowledge of what any W.E. minimally requires in order to function. Two specific points should be made clear under this heading:

- (a) The continued effectiveness of the M.C.S. itself will have to be monitored. Early recruitment, training and development experiences will indicate any feature of the system which may need modification. It will be necessary to develop feed-back from the W.E.'s to M.D.P. in order to determine the effectiveness of the M.C.S. Equally important will be the development of evaluation skills within M.D.P. A start will be made on this during the first three months of the manpower consultants assignment in Indonesia.
- (b) At each job level established by the M.C.S., recommendations are made regarding the basic educational level likely to be required. However, once a person has joined the W.E. his progress through the organization should become less dependent on meeting formal educational criteria and increasingly dependent on his actual job performance and potential.

It is in this respect that inflexible use of the M.C.S. can lead to failures in identifying and developing talent, whatever the level of educational attainment at the point of entry. When a particular educational level is referred to in the M.C.S., it should be taken to mean that the individual who will perform a job at that level well, is one who is likely to have abilities about equal to those required for success at that educational level. It does not necessarily mean that he has actually experienced the educational system up to that level.

To demand increasingly high educational qualifications at different levels in the organization is both irrelevant and will seriously limit promotion opportunities for those people who join a W.E. at junior level but who show obvious talents and abilities which the W.E. should make good use of..

The Manpower Classification system proposed here, acknowledges the basic nature of the ideal Indonesian Water Enterprise as set out in Buku Pedoman. Namely:

That it should be an enterprise which is sufficiently financially independent and has sufficient technical and managerial knowledge to be able to operate, maintain and expand the piped water supply in its distribution area to the major part of the population in the shortest possible time, under its own management.

This paragraph was not taken directly from Buku Pedoman but effectively summarises the objectives as set out in that publication. It is in fact the slightly modified version of paragraph which appears in the DHV Phase I Report September 1980 section 1.2.

It does not matter to a Manpower Classification system whether a Water Enterprise has the status of:

- P.A.M.
- P.D.A.M.
- B.P.A.M.

Regardless of its existing status, there is a minimal level of organisation needed to ensure effective functioning. There are basic areas of expertise which any Water Enterprise must have. The M.C.S. offers a simple way of assembling people with the right skills to provide that expertise.

3. DEVELOPING THE MANPOWER CLASSIFICATION SYSTEM (M.C.S.)

A serious of logically related questions have to be asked. They are:

- 1). What are the primary functions of any water enterprise?
- 2). What broad areas of activity must be associated with satisfying the requirements of each of the primary functions?
- 3). What are the key activities to be performed within each activity area?
- 4). What is the optimum way of assembling these activities into coherent jobs which consistently meet the simple rule developed earlier that if a job can be carried out by an individual with a low level of education and skill then it should not be undertaken by a more highly qualified person.
- 5). What skills, knowledge and attitudes are required of the person who is going to function effectively in each job?

Answers to questions 1-4 provide the data base for the Manpower Classification System. The effort of the Manpower Planning Consultant to date has very largely been directed toward seeking answers to such questions as they apply to the Urban Water Supply Sector in Indonesia. The outcome is detailed in subsequent sections of this report. Seeking answers to 5) will need to be found through detailed task analysis.

3.1. WHAT ARE THE PRIMARY FUNCTIONS OF ANY W.E.?

- A. It must maintain the production of water in the right quantity to meet consumer demand and of the right quality (PRODUCTION).
- B. It must maintain the distribution of the supply to the consumer at a level of service acceptable to the consumer (DISTRIBUTION).
- C. It must manage the collection of revenues from consumers and maintain its own management information system (FINANCE).
- D. It must maintain level of organisational capability consistent with meeting the demands of A, B, and C. above (ADMINISTRATION).
- E. It must Plan adequately for its own future growth (PLANNING).

3.2. WHAT BROAD AREAS OF ACTIVITY MUST BE UNDERTAKEN IN ORDER TO SATISFY THE REQUIREMENTS OF EACH OF THE PRIMARY FUNCTIONS?

A. PRODUCTION

1. Control and maintenance of HEADWORKS/SERVICE RESERVOIR
2. Operation and control of WATER TREATMENT PROCESS
4. Maintenance of WATER TREATMENT PLANT
5. Operation and control of WATER TESTING PROCESS
6. Maintenance of WATER TESTING FACILITIES
7. Operation and control of PUMPING PLANT
8. Maintenance of PUMPING PLANT

B. DISTRIBUTION

1. LEAK DETECTION
2. Repairs to MAINS and SERVICE CONNECTIONS
3. Maintenance of VALVES and SPECIAL FITTINGS
4. Flushing of MAINS
5. Mains Extensions
6. New consumer connections/disconnections

C. FINANCE

1. Issue of BILLS TO CONSUMERS
2. REVENUE COLLECTION
3. Maintenance of CONSUMER ACCOUNTS
4. Analysis and collation of BUDGET PROPOSALS
5. GENERAL ACCOUNTING
6. Provision of FINANCIAL INFORMATION relating to the PERFORMANCE OF THE ENTERPRISE

D. ADMINISTRATION

1. Personnel Administration
2. Maintenance of RELATIONSHIPS between the ENTERPRISE and the CONSUMER (public relations)
3. Purchase of SUPPLIES for the ENTERPRISE
4. Administration of STORES for the ENTERPRISE

E. PLANNING

1. Forecasting CONSUMER DEMAND LEVELS
2. Design of NEW WORKS
3. Developing and maintaining records (e.g. drawings)

3.3. WHAT ARE THE KEY ACTIVITIES TO BE CARRIED OUT WITHIN EACH BROAD
ACTIVITY AREA?

3.3.1. PRODUCTION

1. Control and maintenance of head works:

- (a) Keeping waterways clear
- (b) Cleaning e.g. Pump Intakes
Gravity Intakes
- (c) Protection of source e.g. From animals/insects
- (d) Grass cutting and weeding
- (e) Identifying and taking appropriate actions to
combat changes in water quality e.g. growth of
algae in the service reservoir
- (f) Carrying out planned routine cleaning of service
reservoirs.
- (g) Operation of pumping equipment

2 and 3. Operation and control of water treatment process and
maintenance of plant.

- (i) e.g. Gravity intake from spring source - simple chlorination
 - (a) Taking water samples
 - (b) Mixing chemicals
 - (c) Application of chemicals
 - (d) Adjustment of dosages
 - (e) Recording water and chemical flows
 - (f) Recording use of chemicals
 - (g) Conducting comparator tests
 - (h) Identifying, reporting, and correcting malfunctions. e.g.
blockages in a simple gravity dosing situation
 - (i) Maintaining simple chemical plant
 - (j) Recording rainfall and temperature.

N.B. At this stage no indications are made as to who would be responsible for conducting each activity. For example: in the above list, reporting and identifying malfunctions are likely to form part of one job whereas taking corrective action to deal with malfunctions is likely to form part of another job requiring the use of more specialist and more highly developed skills

(ii) Chlorination plus aeration e.g. well source with high CO₂ content. All key activities set out under a-j above apply and with the following additions:

- (K) Operation and maintenance of simple treatment plant.
- (L) Maintenance of aeration plant e.g. brushing/cleaning and the operation of valves for this purpose
- (M) Identifying, reporting, and correcting malfunctions in pumping and aeration plant.

(iii) Small water treatment plant - Slow sand filter

Since chlorination is usually included in the total treatment process, a-j apply here. Additional key activities are:

- (N) Adjusting outlet rate
- (O) Assessment of filter maturing
- (P) Sand removal
- (Q) Sand cleaning
- (N) Sand replacement

(iv) Small water treatment plant - Rapid gravity

- (S) Adjusting dosages of appropriate chemicals
- (F) Checking on levels, noting any changes
- (U) Cleaning sedimentation tanks
- (V) Backwashing filters

(v) Softening plant - Lime - Soda

The treatment process here is as for the rapid gravity plant, but with the addition of:

- (W) Mixing chemicals

(vi) Softening plant - Base exchange

The treatment process here is as for the rapid gravity plant, but excludes the cleaning of sedimentation tanks.

(vii) Full treatment with semi-automatic plant

(X) Monitoring and maintaining plant:

- (a) Adjustment and maintenance of automatic control equipment
- (b) Maintenance of associated mechanical plant
- (c) Maintenance of chemical plant
- (d) General cleaning
- (e) Careful cleaning of automatics

(Y) Adjusting variables ensuring water quality

- (a) Mixing chemicals
- (b) Flocculation
- (c) Settling
- (d) Sludge removal
- (e) Filter cleaning

(vii) Maintain full records of all work carried out.

4. Operation and control of water testing process

(a) Take water samples before, during and after treatment.

For simple chlorination treatment.-

(b) Conduct comparator tests for pH, before and after treatment.-

- (i) Measure standard water samples
- (ii) Add specified quantities of reagents
- (iii) Compare colours
- (iv) Record values.

(c) Conduct comparator tests for residual chlorine after treatment

For Treatment Plants.-

(d) Conduct jar - tests

- (i) Measure standard water samples
- (ii) Add specified %'s of chemicals
- (iii) Select appropriate doses for treatment
- (iv) Communicate treatment requirements to treatment plant staff
- (v) Record data

(b) Test for pH as above, but before, during and after treatment

(e) Conduct turbidity - test, using optical method

- (i) Measure standard water samples
- (ii) Check readings
- (iii) Conduct tests on raw, treated and final water
- (iv) Record readings

(c) Test for residual chlorine as above

With all treatment processes

- (f) Check final water at regular intervals throughout the distribution system, particularly at 'dead - ends' for pH and residual chlorine using comparator tests as in (b).

The following testing should also be carried out in all Water Enterprises.

- (g) Conduct full chemical analysis in accordance with W.H.O. standards.

In the smaller W.E.'s without laboratory facilities the 'on-site' task will be a simple but important routine

- (i) Take water samples at intervals determined by W.H.O. standards, label and send to laboratory for testing. Check and record results when they return.

- (h) Conduct full bacteriological analysis in accordance with W.H.O. standards.

Again in W.E.'s without such testing facilities, the routine on-site activity will be,

- (i) Take routine water samples, using a sterile bottle, at intervals determined by W.H.O. standards. Label and send to laboratory for analysis, check and record the results when they return.

N.B. It is vital that results of water testing activities are fed back into the production system if they are to be of any value in production control.

5. Maintainance of Water Testing Facilities

- (a) Record chemical usage
- (b) Record equipment breakages
- (c) Determine replacement requirements for chemicals and equipment
- (d) Maintain equipment
- (e) Keep facilities clean

3.3.2. DISTRIBUTION

1. Leak detection

- (a) Systematic visual inspection of pipelines, sluice valves, air valves and meters
- (b) Monitoring percentage of unaccounted for water by close liaison with finance department
- (c) Locating leaks through operation of leak detection unit
- (d) Maintaining records of leakages

2. Repairs to mains and service connection

- (a) Removal and replacement of damaged sections of mains pipeline
- (b) On-site repairs to damaged sluice valves
- (c) On-site repairs to damaged air valves
- (d) Removal and replacement of damaged air valves
- (e) Repairs to service pipes
- (f) Replacement/repairs of service meters
- (g) Replacement/repair of service valves
- (e-g) Apply equally to public taps, house and yard connections and commercial connections

3. Repairs to meters and special fittings (including pressure release Valves, Equilibrium valves, Flows meters etc.)

- (a) Repairs on site when possible
- (b) Removal and, replacement when workshop repairs necessary

4. Flushing of mains.
5. Inspection of all new connections and distribution system valves
6. Reading meters and recording faulty meters

3.3.3. FINANCE

- (1) Issue of bills to consumers.
 - (a) Preparation of bills from information provided
 - (b) Prepare records of bills issued to consumers
 - (c) Send bills to consumers
- (2) Revenue collection.
 - (a) Collect money from consumers
 - (b) Record amounts paid by consumers
 - (c) Record all incoming money
 - (d) Ensure security of money on-site and arrange transfer to bank
- (3) Maintenance of consumer accounts.
 - (a) Collation of information relating to consumer accounts
 - (b) Updating customer accounts
 - (c) Maintain storage/retrieval system for consumer account records
- (4) Preparation, collation and allocation of budgets.
 - (a) Analysis of budget proposals from all W.E. departments
 - (b) Preparation of budget allocations to all W.E. departments
- (5) General accounting.
 - (a) Payment of accounts
 - (b) Payment of salaries and wages
 - (c) Control of petty cash

(6) Provision of financial information relating to W.E. performance.

- (a) Book-keeping
- (b) Preparation of balance sheets
- (c) Determination of profit and loss and any other relevant financial ratios
- (d) Preparation of financial reports

3.3.4. ADMINISTRATION

(1) Personnel administration.

- (a) Recruitment and selection of staff
- (b) Manpower planning in liaison with planning department
- (c) Maintenance of effective personnel records
- (d) Training and development of staff
- (e) Ensuring that any legislation/regulation concerning terms of employment and working conditions are met
- (f) Administration of performance appraisal system

(2) Maintenance of relationships between the W.E. and consumers.

- (a) Notify consumers of any failure to supply
- (b) Notify consumers of any planned restriction in supply
- (c) Notify consumers of availability of connections (e.g. during mains extensions)
- (d) Referring customer complaints to appropriate W.E. departments.
- (e) Responding to customer complaints
- (f) Answering customer queries

(3) Purchase of supplies for the W.E.

- (a) Purchase all supplies for the W.E. in close cooperation with all departments
- (b) Maintain records of all supplies purchased
- (c) Maintain checks on quantity and quality of supplies received against supplies ordered

(4) Administration of stores for the W.E.

- (a) Maintenance of stores system
- (b) Receive and issue stores
- (c) Maintenance of stock inventory
- (d) Maintenance of stock levels/stock control
- (e) Stores administration including stock taking
- (f) Ensure store security

3.3.5. PLANNING

(1) Forecasting consumer demand levels.

- (a) Determine the number of new connections possible
- (b) Determine ability of potential customers to pay
- (c) Conduct market research surveys to determine other factors influencing potential customer decisions

(2) Design of new works.

- (a) Conducting technical studies
- (b) Developing plans for new works
- (c) Conduct surveys for new works
- (d) Tendering
- (e) Supervision of contractors employed on new works

(3) Developing and maintaining records of drawings.

- (a) Prepare drawings from information provided
- (b) Conduct simple designs of new works
- (c) Prepare 'as-built' drawings
- (d) Maintain records of drawings

Since the workshop covers (at least in larger enterprises) a wide range of activities and provides a number of services to various departments, it is dealt with separately here. A further reason for focussing on the workshop as a separate entity comes from the recommendation made earlier that to establish some form of centralisation of workshop resources would be the most cost-effective means of providing the full range of services required to the individual W.E.

In staffing the workshop for a particular enterprise it is there-
for necessary first to identify the boundaries of activity and
then to identify jobs for which personnel will need to be recruited.

3.3.6. THE WORKSHOP

- (a) Maintenance of all mobile plant
 - e.g. - Cranes
 - Excavators
 - Compressors
 - Heavy duty vehicles
 - Cars
- (b) Repairs to all mobile plant
- (c) Maintenance of static plant
- (d) Repairs to all static plant
- (e) Inspection of mobile and static plant
- (f) Develop and implement planned routine maintenance procedures for mobile and static plant
- (g) Maintenance of mechanical equipment
 - e.g. - Diesel engines
 - Pumps
- (h) Repairs to all mechanical equipment in the W.E.
- (i) Replacement/installation of mechanical equipment
- (j) Routine inspection of mechanical equipment
- (k) Develop and implement planned routine maintenance procedures for all mechanical equipment
- (l) Maintenance of all electrical equipment and installations in the W.E.
- (m) Replacement/installation of electrical equipment
- (n) Routine inspection of electrical equipment
- (o) Repairs to all electrical equipment and installations
- (p) Develop and implement planned routine maintenance procedures for all electrical equipment and installations
- (q) Maintenance of buildings in the W.E.
- (r) Repairs to buildings and fittings
- (s) Routine maintenance/repair of consumer meters
- (t) Repairs to flow meters
- (u) Repairs to pumps
- (v) Repairs to valves

In addition, the workshop would need to:

- (w) Develop and implement policies on the use of all plant and transport resources
- (x) Develop policies for replacement of plant, vehicles and equipment
- (y) Maintain full records of all maintenance and repair work undertaken

Because the auditing of accounts should be carried out by sources independent of those responsible for preparing accounts, this too is separated out.

3.3.7. AUDITING

- (a) Conduct all internal auditing activities

8. JOB DESCRIPTIONS

The immediate result of the M.C.S. is clusters of tasks which logically fit together rather than complete job descriptions. It has further been noticed that such documents as have been proposed as job descriptions are either incomplete and therefore cannot fulfil the range of purposes to which they could usefully be put, or they contain additional information beyond what is required of a job description (for example, personnel specification data).

In addition, the purpose of preparing job descriptions has to date and quite understandably, been to provide a basis for identifying training needs so that basic training programmes can be launched with minimum delay.

For the future organisational health of the W.E.'s however, it is necessary to agree a final form for job descriptions, covering all W.E. employees. The final form should be one which both satisfies the needs of those responsible for training and development at the present time (DHV, IWACO, MDP, P.T. Unisystems etc) and in addition satisfies the longer-term management and development needs of the W.E.'s and the individuals employed by them.

Full job-description will be particularly important in maintaining the grading structure proposed by the MCS. It is only through careful manpower resource planning and systematic development of staff within the W.E.'s that the grading structure can be maintained and the ideal policy of future promotion from within can be met.

A good job-description is more than a simple task description. For senior people in particular, it should establish the job boundaries (i.e. the complete set of conditions under which the job has to be performed.)

A sample format for the job-description of a manager/specialist/highly skilled person is set out overleaf.

For junior staff (e.g. unskilled and semi-skilled), the job-description is much simpler. It need consist only of:

1. The job title
2. The job title and name of the person (supervisor) to whom the job holder reports
3. Detailed descriptions of tasks to be carried out

Well prepared job-descriptions are powerful managerial instruments. From the job-description, the following activities become much easier to implement:

JOB DESCRIPTION - FORMAT FOR SENIOR STAFF

1. JOB TITLE
2. NAME OF JOB-HOLDER

2. JOB TITLE of the person to whom the job-holder reports

4. JOB TITLES of all people who report directly to the job-holder
 - i
 - ii etc

5. JOB TITLES of all people in the W.E. with whom the job-holder must co-operate closely.
 - i
 - ii etc

6. A statement of THE MAIN PURPOSE OF THE JOB
.....
.....

7. A series of statements of THE KEY TASKS of the job
 - i
 - ii etc

8. LIMITS OF THE JOB-HOLDERS AUTHORITY
 1. POLICY what are the specific policies within which the job-holder must work.
.....
.....

 2. FINANCIAL what are the limits within which the job-holder can authorize expenditure.
.....
.....

 3. PERSONNEL what are the limits to the job-holder authority for recruiting, disciplining and dismissing staff.
.....
.....

8.1. PREPARATION OF PERSONNEL SPECIFICATIONS

For the future, effective recruitment should be based on the preparation of accurate personnel specifications. Knowing what the job demands are, through the job description, is on its own insufficient in determining the qualities, educational qualifications, professional knowledge and so on which will be needed of the person who is likely to be able to perform the job well. To do so requires that the job-description be translated into a form which displays the characteristics of the person who will be able to meet the demands specified in the job-description.

A frequently used format for the personnel specification is shown overleaf

8.2. PERFORMANCE APPRAISAL

In order to monitor the effectiveness of an individual in his job, it is necessary to know what he should be doing. That is a product of the job description.

The appraisal system is then used to identify the development and training needs for:

- 1) Maintaining or improving performance in the present job.
- 2) Developing the individual beyond his present job and preparing him to take on increased responsibility.

Effective application of a performance appraisal system also provides the basis for maintaining an inventory of manpower capabilities within the W.E.

8.3. DESIGN OF TRAINING AND DEVELOPMENT PROGRAMMES

The design of training modules and development programmes can only proceed satisfactorily from the detailed analysis of job content (tasks) and job context (conditions) which is provided by the job description.

A particularly important application here, is that of identifying and specifying the "development gap" between the job a person is doing now and the next job to which he could be promoted.

8.4. JOB EVALUATION

It has already been suggested that the M.C.S. is not the most effective method for determining accurately the differentials in salaries or wages which should exist between different jobs.

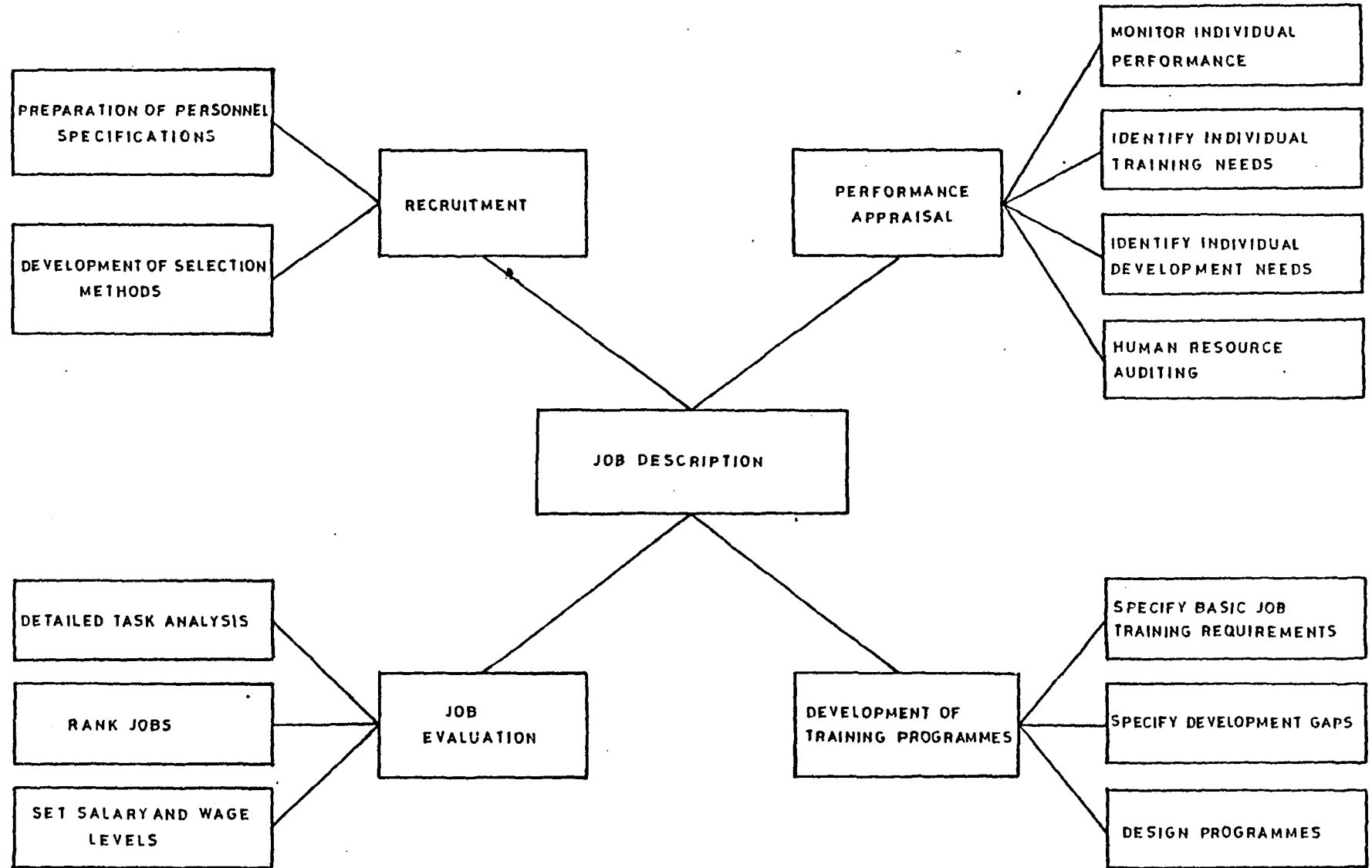
FORMAT FOR PERSONNEL SPECIFICATION

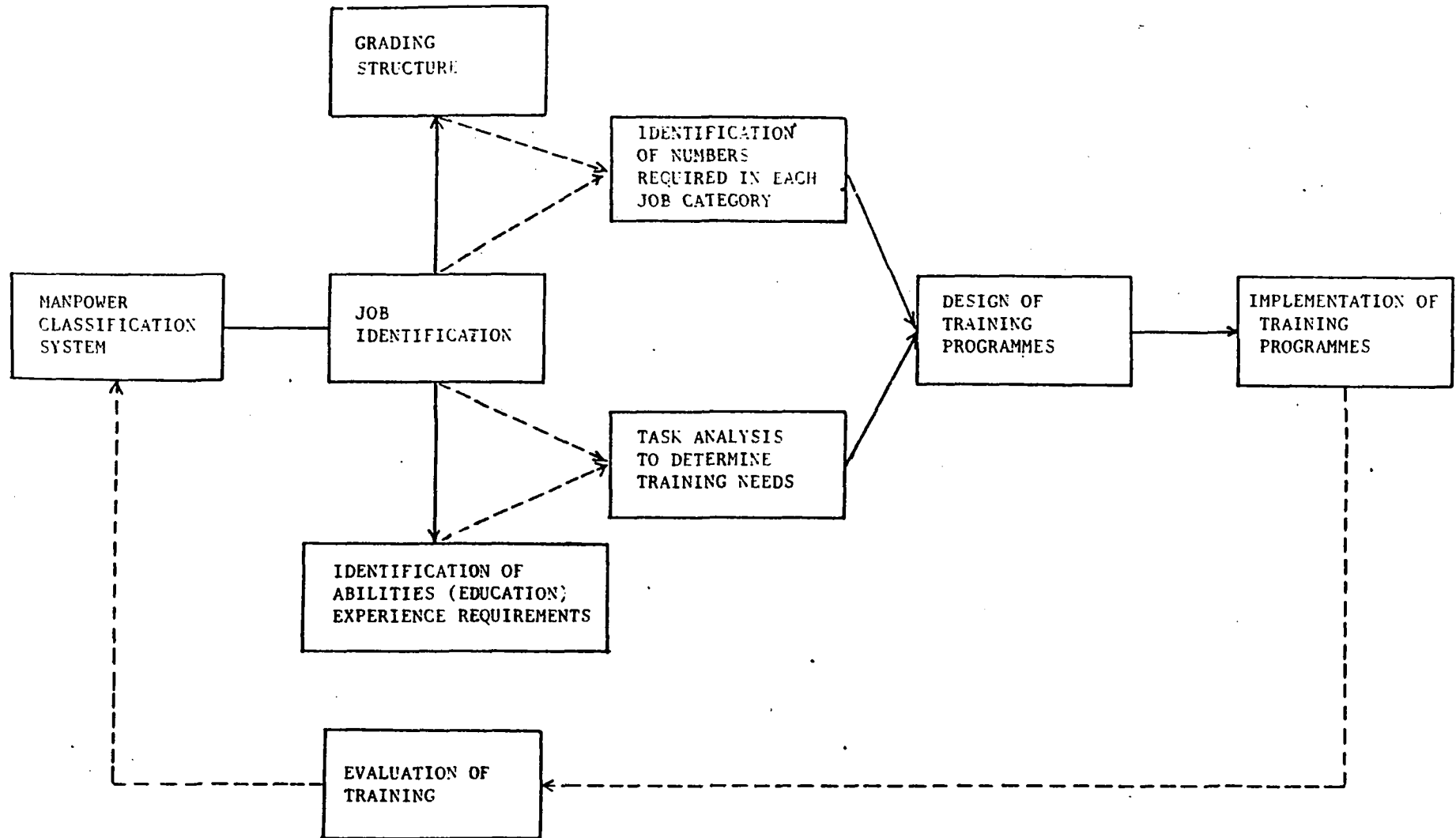
	ESSENTIAL REQUIREMENTS	DESIRABLE REQUIREMENTS	UNACCEPTABLE CHARACTERISTICS
1. PHYSICAL			
2. QUALIFICATION			
3. ABILITY			
4. SPECIAL APTITUDES			
5. EXPERIENCE			
6. MOTIVATION			
7. SPECIAL CONDITIONS			

However, the job descriptions which result from the MCS can be used as the starting point for a more detailed task analysis which would show precisely how a (in terms of skills knowledge and other job related demands) any one job ranks above or below all other jobs. What the M.C.S. is perfectly suited to doing is developing a grading structure which indicates for operational control purposes, whether a job is more senior or more junior to other jobs in the W.E.

It is recognised that this may not be too important a consideration in the Indonesian water sector at the present time.

POSSIBLE USES TO WHICH A JOB DESCRIPTION CAN BE PUT





4. Job Descriptions.

- 4.1. The following pages indicate the grading of jobs within the water enterprises for junior staff, that is those staff who are generally concerned with routine work.
- 4.2. Training requirements not specifically related to water enterprises are expected to be met from vocational institutions, e.g. welders. Training requirements specifically to meet the requirements for water enterprises, will require to be provided by MDP, e.g. a draughtsman will be expected to obtain basic draughting knowledge from an educational/ vocational training establishment, but will require to be trained in pipeline draughting, and other work specifically related to the water enterprises.
- 4.3. Entry qualifications have not been stated, neither have the basic requirement of knowledge where this is indicated by the job title, e.g. a clerk obviously needs to read and write. The requirements can be extended if found to be necessary in the preparation of fully detailed job descriptions.

A PRODUCTION SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>	<u>Useful Additional Information/ knowledge.</u>
A1. Headworks Labourer	Maintains Headworks - production source. General Cleaning, grass Cutting, weeding, cleans intakes Provides labour as required	a) How to clean including buildings b) How to maintain compound in good condition c) May need to know how to swim d) To whom he reports	Introduction to basic principles of public water supply
A2. Water Treatment Plant Operator Grade V Qualifications	As A.1 Mixes chemicals under instruction Maintains simple chemical plant Adjusts chemical dose Records water and chemical flows Records use of chemicals Records rainfall and temperature Takes water samples Reports on malfunctions	As A.1 How to clean equipment How to mix chemicals in use on plant concerned How to adjust flow on plant concerned Simple proportionate arithmetic How to enter records How to measure flows at plant concerned How to weigh and calculate use of chemicals How to use equipment in use at plant and How to read any gauges Reason for the treatment How to take water samples for bacteriological and chemical analysis How to carry out chemical tests using a comparator Who to report to in the event of a malfunction Any safety requirements Simple fault finding	As A.1 Public Health aspects of water supply Very basic chemistry Very basic water biology Operational characteristics of specific plant e.g. Type of pump Reasons for keeping records, how changes can affect operation, or indicate faults developing

A PRODUCTION SECTION

<u>Job Title,</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know</u>	<u>Useful Additional information/knowledge.</u>
A3. Water Treatment Plant Operator Grade IV	As A.2 Operates and maintains simple plant e.g. Small pumpsets, aeration plant	As A.2 How to maintain the specific plant Normal running conditions How to start/stop equipment at plant How to open and close valves Reason for the treatment	As A.2
A4. Water Treatment Plant Operator Grade III.	As A.3 for small water treatment plants capacity less than 25 l/sec	As A.3 Basic concept of treatment involved What chemicals are used How to operate the plant How to carry out routine maintenance Limits of responsibility	As A.3
A5. Water Treatment Plant Operator Grade II	As A.4 for treatment plants with capacity between 25 and 50 l/sec	As A.4 More advanced technology as related to the specific plant	As A.4
A6. Water Treatment Plant Operator Grade I	As A.5 for treatment plants with capacity more than 50 l/sec	As A.5	As A.5

A PRODUCTION SECTION

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know</u>	<u>Useful Additional information/knowledge.</u>
A7. Water treatment Plant technician Grade III.	Supervise operation of water treatment plant up to capacity of 25 l/sec, or in charge of shift of larger plant Control water treatment plant staff Determine daily chemical applications Check use of chemicals and fuel and reorder as necessary check records and make reports Prepare time sheets and attendance records etc.	As A.5 How to organize and control staff Basic principles of supervision How to prepare standard chemical solutions, carry out jar tests and calculate required chemical applications Requirements for records and reporting	As A.5 The water cycle Principles of various types of water treatment More advanced chemistry and biology
A8. Water Treatment Plant Technician Grade II	As A.7 for plant capacities between 25 l/s and 50 l/s or in charge of shift for larger plant	As A.7	As A.7
A9. Water Treatment Plant Technician Grade I	As A.8 for plant capacities of over 50 l/sec or in charge of shift of larger plants	As A.8	As A.8

A PRODUCTION SECTION

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>	<u>Useful Additional information/knowledge</u>
A10. Water treatment Plant Supervisor Grade III	Supervises the work of water Treatment Plant Technicians in major installations Responsible for control of plant, costs, budgetting etc. Reordering of stock materials, chemicals, fuel, spares etc. Training of water treatment staff	As A.9 How to prepare budgets and their use Basic training principles	As A.9 More advanced water biology and chemistry Approach to public relations
A11. Water treatment Plant Supervisor Grade II	As A.10 but for plants of capacities 250 l/s to 500 l/s	As A.10	As A.10
A12. Water treatment Plant Supervisor Grade I	As A.11 but for plants of capacity over 500 l/s	As A.11	As A.11

A PRODUCTION SECTION

Job Title.

A13. Laboratory Assistant	Collection of water samples Carrying out tests for treatment required Monitoring treatment Keeping appropriate records	How to take water samples Use of jar test equipment Use of comparitor Handling of laboratory equipment Records required who to report to
A14. Laboratory Technician	As A.13 Undertakes bacteriological and chemical testing under general supervision	As A.13 How to complete bacteriological testing More advanced chemical testing Basic chemistry
A15. Plant Chemist	As A.14 Undertakes water quality analysis and associated investigations Responsible for organisation and control of small laboratory carrying out routine chemical and bacteriological testing	As A.14 Theory of water treatment Range of chemicals used Principles of water chemistry Principles of water biology Basic principles of management
B1. Labourer mains-laying.	a) Carry out trenching to lines and levels b) Load/unload pipes, fittings etc. c) Assist pipe fitter and plumber.	a) How to trench, use tools provided b) How to handle pipes, fittings etc.

B. DISTRIBUTION SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities</u>	<u>Needs to know</u>	<u>Useful additional information/knowledge.</u>
B2. Patrolman	a) Checking pipe tracks, and installation, e.g. valve chamber etc. b) Operates valves under instruction c) Reports on conditions	a) Location of pipe track and fittings to be inspected b) How to operate valves c) Who to report to, and what to include in the report.	
B3. Pipe fitter Grade III	a) Carry out trenching to lines and levels b) Handling of pipes and fittings c) Lay pipes up to 6" diameter, including installation of fittings d) Repairing pipe lines up 6" diameter, including fittings e) As B.2	a) How to trench to lines and levels e.g. use of boning rods b) How to lay pipes up to 6" diameter and installation of fittings as used in the W.E. c) Simple slinging, use of ropes, etc.. d) How to repair pipes up to 6" diameter as used in the W.E. e) How to repair fittings as used in the W.E. f) Safety requirements g) As B.2	a) Reasons for accurate trenching b) Basic Hydraulics functions of various fittings c) How to read pipe lay out drawings.
B4. Pipe fitter Grade II	As B.3 but for piping up to 12" diameter	As B.3 but for piping up to 12" diameter use of pulleys, tripods, chain blocks and simple lifting devices.	As B.3

B. DISTRIBUTION SECTION.

<u>Job title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know</u>
B5. Pipe fitter Grade I	As B.4 but for piping up to maximum in use in Indonesia.	As B.4 but for larger piping Use of more complex lifting equipment including slinging for cranes
B6. Foreman Pipe fitter Grade III.	a) Responsible for supervising up to three pipe fitters Grade III b) Maintains records of costs/materials c) Prepares work sheets d) Marks out new pipeline tracks e) Undertakes tests of pipelines f) Undertakes scouring/flushing of distribution system under instruction g) Instructs pipe fitters	a) As B.5 b) How to organise and control staff c) Basic principles of supervision d) Procedures in force in the W.E. for recording costs and materials used e) How to prepare work sheets f) How to read plans showing pipeline tracks g) How to test pipelines h) Basic principles of training
B7. Foreman Pipe fitter Grade II	As for B.6 but for pipe fitters Grade II	As for B.6 but for larger piping
B8. Foreman Pipe fitter Grade I	As B.7 but for Pipe Fitter Grade I	As B.7 for large diameter piping

B. DISTRIBUTION SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know</u>
B9. Distribution Supervisor Grade III	a) Responsible for supervising and organising foreman pipe fitters, fitters and plumbers, in systems of up to 5000 connections b) Undertaking inspection, of plumbing installations c) Responsible for safety precautions d) Undertakes waste metering e) Organises and controls maintenance of the distribution system f) Lays out new pipelines g) Prepares information for "As Built" drawings h) Organises and schedules pipe scouring/flushing.	a) Basic principles of management b) Plumbing code - regulations c) Safety regulations d) Principles of waste detection "unaccounted for" water e) Basic hydraulics of the W.E. distribution system f) How to read pipeline drawings g) How to prepare sketches for "As Built" drawings
B10. Supervisor Grade II	As B.10 but for systems having up to 10,000 connections.	
B11. Supervisor Grade I	As B.11 For systems having over 10,000 connections.	

B. DISTRIBUTION SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities</u>	<u>Needs to know</u>	<u>Useful additional information/ knowledge.</u>
B12. Plumber	a) Carries out installation of communication pipe b) Instals meter c) Completes records of works	a) How to consect communication pipe to main, (depth of trench etc.) i) Under pressure tapping ii) Making tee connection b) How to instal all types of small bore tubing in use in the water enterprise (uPVC, GI, Copper etc.) c) How to instal the meter d) Records to be maintained, procedures to be followed e) Safety precautions to be followed f) For some water enterprises may need to know how to instal the internal plumbing to buildings	Basic hydraulics Plumbing Code

B. DISTRIBUTION SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities</u>	<u>Needs to know</u>
B13. Foreman Plumber	<ul style="list-style-type: none">a) As B.12b) Responsible for supervising the work of up to 5 plumbersc) Maintains records of costs/materialsd) Prepares work sheetse) Inspects consumers' installations, and issues satisfactory completion reportsf) Undertakes instruction of plumbers	<ul style="list-style-type: none">a) As B.12b) How to organise and control staffc) Basic principles of supervisiond) Procedures in force in the W.E. for recording costs and materials usede) How to prepare work sheetsf) Plumbing Code - how to check plumbing installationsg) Basic principles of training
B14. Waste Inspector	<ul style="list-style-type: none">a) To carry out waste detection surveys.	<ul style="list-style-type: none">a) General hydraulics as applied in distribution systemsb) Theory of waste detectionc) Use of instruments + meters etc.d) Plumbing code.

C. PLANNING SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know</u>	<u>Useful Additional information/ knowledge.</u>
C1. Tracer	Prepares tracings from existing drawings, re-lettering, etc. Prepares drawings from dimensioned sketches.	Use of drawing instruments Different types of materials used in the drawing office	How to read engineering drawings drawings
C2. Draughtsman Grade III	As C.1 Prepares drawings from sketches undertakes simple dimensional calculations Keeps "As Built" drawings up to date from information supplied Numbers and amends drawings	As C.1 How to read engineering drawings Basic arithmetic, including decimals and fractions	Principles of distribution systems
C3. Draughtsman Grade II	As C.2 Prepares drawings from sketches. Undertakes calculations for "standard" installations	As C.2	As C.2 Basic hydraulics Building design
C4. Draughtsman Grade I	As C.3 Prepares drawings from sketches. Undertakes simple designs including single line flow calculations	As C.3 Basic knowledge of algebra How to use nomograms in relation to pipe flows and other calculations. Basic hydraulics Building design	

C. PLANNING SECTION.

<u>Job Title,</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know</u>	<u>Useful Additional information/knowledge.</u>
C5. Senior Draughtsman	Responsible for the work of not less than three draughtsman	As C.4 How to organise and control staff Basic principles of supervision	As C.4
C6. Chief Draughtsman	Responsible for the work of not less than three senior draughtsman. Preparation of budgets for Drawing office work	As C.5 How to prepare budgets and maintain budgetary control	As C.5 Principles of Management
C7. Survey Labourer	Carries out general duties to assist survey crews e.g. carry equipment set marker pegs	How to carry equipment	
C8. Chainman	Assists surveyor Carries staff Holds chain/tape	As C.7 How to hold staff Where to measure on chain or tape	
C9. Instrument man	Able to set out instruments Run line of levels	How to set up instruments How to level Basic arithmetic	

C. PLANNING SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
C10. Surveyor Grade III	Responsible for direct. line Surveying for pipe lines Prepare sketches of layouts for "As Built" drawings	Basic surveying - use of level and Theodolite. Pipe line layouts How to read pipeline drawings
C11. Surveyor Grade II	Responsible for surveying for pipelines and also land surveys	As C.9 Traversing and triangulations land surveys
C12. Surveyor Grade I	As C.11 Able to adjust instruments	As C.11 How to adjust instruments
C13. Senior Surveyor	As C.12 Responsible for the work of not less than three surveyors	Principles of organisation and management Principles of supervision.

C. PLANNING SECTION

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>	
C14. Chief Surveyor	As C.12 Responsible for the work of not less than three senior surveyors. Preparation of budgets for survey works	As C.13 How to prepare budgets and maintain budgetary control	Principles of Management
C15. Estimator	Prepares detailed costing from drawings, bills of quantities and contract documents. Takes measurements and prepares payment certificates for contracts.	How to measure works and prepare payment certificates How to read drawings How to prepare estimates	

D. WORKSHOP SECTION.

D1. Mason	Carry out installation of anchor blocks, valve chambers and general masonry work.	How to mix concrete, lay bricks, set valve covers. Safety requirement	
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D. WORKSHOP SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
D2. Carpenter	Carry out trench timbering, formwork for anchor blocks and rough timbering works.	Principles of timbering of trenches, strutting, etc. Rough jointing.
D3. Joiner	Carry out works of D2. Also undertakes close timbering and fairfaced works, including borrier preparation etc. Repair to buildings	As D2. knowledge of woods to use How to prepare joints in timber.
D4. Painters	Undertakes painting works, including corrosion protection on pipe fittings.	Principles of painting
D5. Foreman Artisan	Organises and supervises work of artisans.	Principles of organisation and supervision. Safety requirements
D6. Supervisor Artisan.	Organises and supervises work of foreman artisan. Responsible for training of artisans.	As D,5 Preparation of budgets and their use. Basic principles of training.

D. WORKSHOP SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
D7. Tradesmen (Artisan)	Working in accordance with trade. e.g. Blacksmith, welder, millwright etc.	Basic requirements of the trade Safety requirements
D8. Meter repairers	Undertakes repairs/overhauls to mechanical meters, including removal.	How to overhaul meters How to instal/remove meters
D9. Mechanical fitter Gd III	Undertakes routine maintenance, re- placement parts of small pumps, motors, machines etc including ve- hicles.	Principles of mechanical plant. Specific plant requirements. How to use manuals. Safety requirements
D10. Mechanical fitter Gd II	As D.9 extended to large plant	As D.9. For larger plant
D11. Mechanical fitter Gd I	As D.10 includes overhaul under supervision	As D.10 How to undertake overhauls
D12. Foreman Mech Fitter	Organises and supervises work of Mech fitters Gd.I.	As D.11 Principles of organisation and supervision.

D. WORKSHOP SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
D13. Supervisor Mech	Organises and supervises work of 3 Foreman Mech fitters. Under- takes training.	As D.12 Preparation of budget. Principles of training.
D14. Electrician • Grade III	Undertakes routine maintenance of small electrical installations, including vehicles	Principles of electricity How to read drawings How to use manuals Specific plant requirements Safety requirements
D15. Electrician Grade II	As D.11 Extended to larger installation	As D.11 For larger installations
D16. Electrician Grade I	As D.12 Includes wiring and overhaul under supervision. Maintenance of instru- ments (e.g. flow recorders).	As D.12 How to maintain instruments.
D17. Electrical Foreman	Organises and supervises work of Electricians Gd. I.	As D. 16 Principles of organisation and management

D. WORKSHOP SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
D18. Electrical Supervisor	Organises and supervises work of 3 Foreman Electricians Undertakes training	As D.17 Preparation of budgets. Principles of training.
D19. Workshop Supervisor	Organises and supervises work of artisans tradesman/foreman/supervisors.	Principles of organisation and management. Preparation of budgets Principles of training. Safety requirements
D20. Driver	Drives light vehicles, capacity less than 5 tonnes.	How to drive. Daily vehicle maintenance. Safety requirements Who to report to.
D21. Driver Heavy Duty	Drives heavy duty vehicles including cranes, excavators	As D.20 How to operate specific plant
D22. Transport Foreman	Supervises and organises not less than ten drivers.	As D.21 How to train on specific plant. Principles of organisation and supervision

E. CLERICAL SECTION.

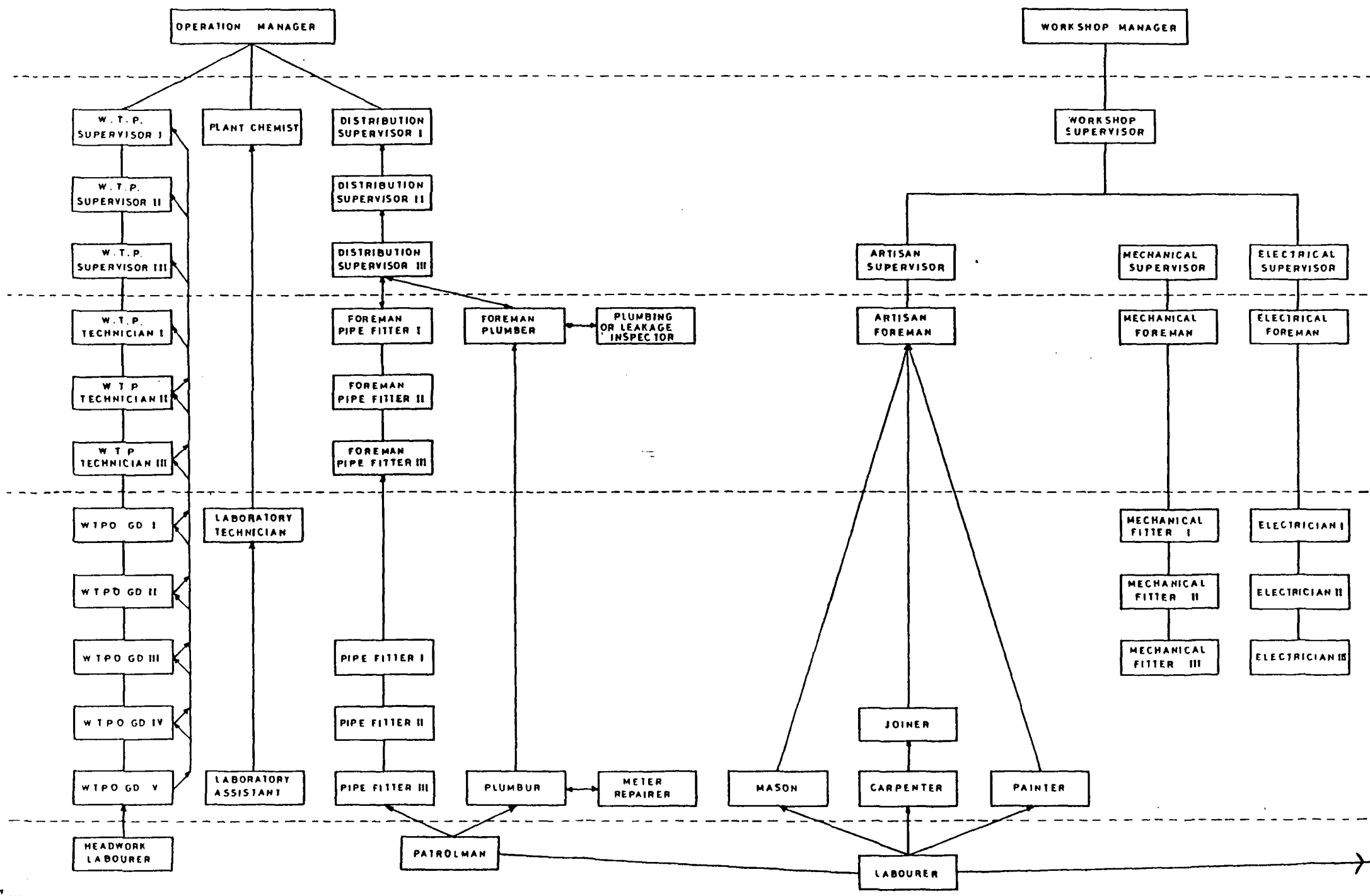
<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
D23. Transport Manager	Supervises and organises not less than twenty drivers. Schedules administration of transport section, purposes budget.	As D.22 Preparation of budgets. Plant replacement policies Principles of training.
E1. Clerk Gd. II	Undertakes clerical work, including preparation of bills from water readings, processing of internal documents, recording data, incoming/outgoing mail etc. Financial transactions under supervision.	Procedures applicable to the work undertaken.
E2. Clerk Gd I	As E.1 including filing, office systems, stationary stock control, inventory-under general supervision.	As E.1
E3. Clerk/Typist Gd. II	As E.2 Plus typing to 40 wpm.	As E.2 How to type at 40 wpm
E4. Clerk/Typist Gd.I	As E.3 Plus typing to 60 wpm	As E.3 How to type at 60 wpm

E. CLERICAL SECTION.

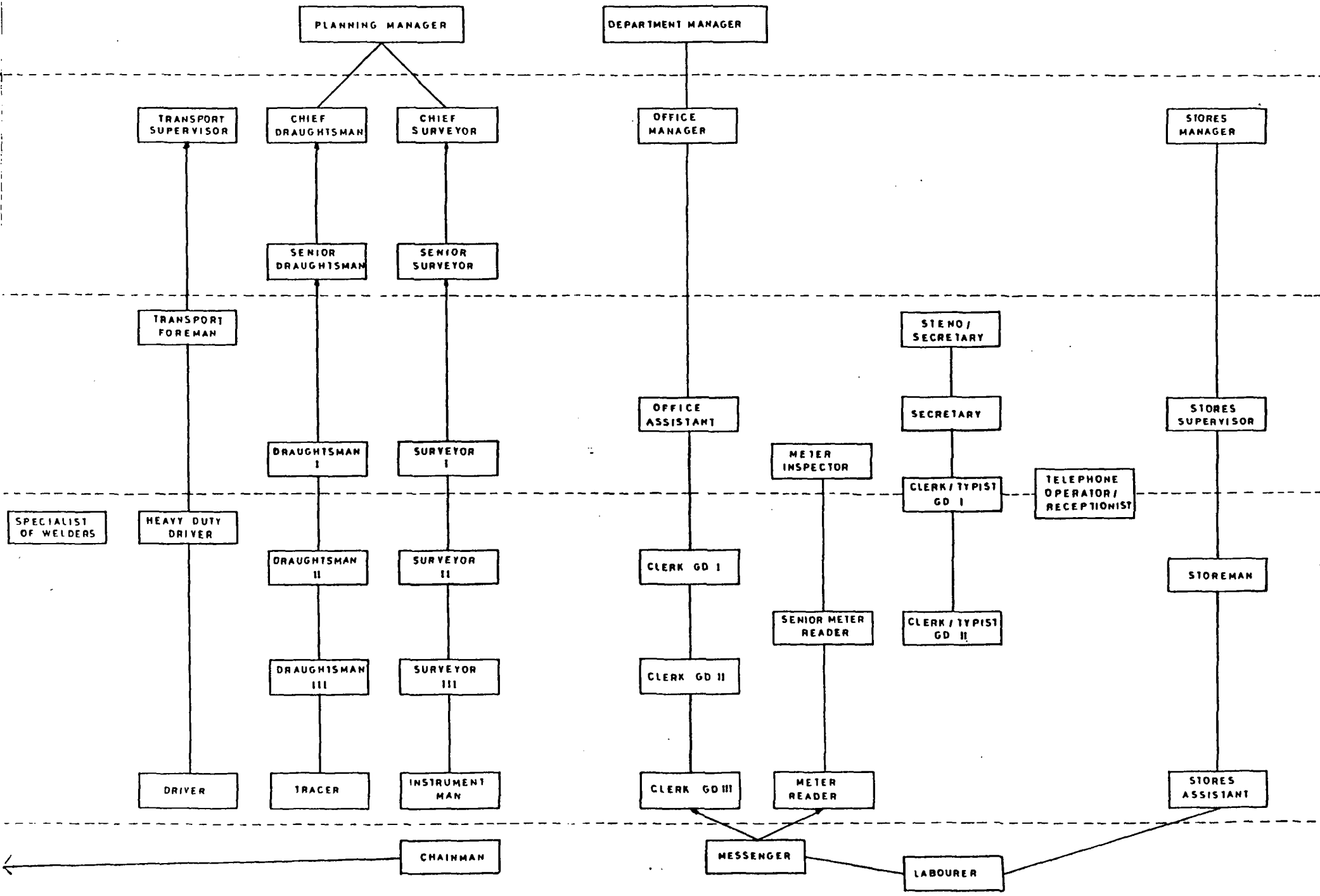
<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities,</u>	<u>Needs to know.</u>
E5. Secretary	As E.3 Supervise work of clerk and typist as necessary. Controls office routine work.	As E.3 Principles of organisation and supervision.
E6. Secretary/Stenographer Gd. II	As E.5 Additional able to dictation At 60 Wpm.	As E.5 Able to take dictation at 60 Wpm.
E7. Secretary/Stenographer Gd. I	As E.6 At 90 Wpm	As E.6 Able to take dictation at 90 Wpm
E8. Stores Clerk Gd.II (or stores Assistant).	As clerk Gr II for stores procedures, internal documents, initiating orders under supervision.	Procedures applicable to the stores inventory and stock control.
E9. Stores Clerk Gd.I or STOREMAN	As E.8 But without immediate supervision for small stores systems.	As E.8

E. CLERICAL SECTION.

<u>Job Title.</u>	<u>Duties/Tasks/Responsibilities.</u>	<u>Needs to know.</u>
E10. Stores Supervisor	As E.9 But for large stores system. Supervising training of storemen.	As E.9 Principles of organisation and supervision. Principles of training.
E11. Office Assistant	Responsible for organisation and control of office staff of up to five clerks and undertakes work of clerk Gd I.	As E.1 Principles of organisation and supervision. Principles of training. Introduction to Public Relations
E12. Office manager	Responsible for organisation and control of office staff of up to ten clerks. Undertakes work of Clerk Gd. I.	As E.11 Principles of management Preparation of budgets.



TAFF



5. Developing the grading structure.

5.1. Criteria.

In identifying levels of ability required for effective job performance, it is possible to apply relatively simple job-related criteria. These are:

1. The degree of routine. This means the extent to which a job can be performed by following simple programmed routines (procedures). The greater the degree of programming possible, the lower the level of ability required.

Call this routine level (R.L.)

2. The level of acquired skill needed to perform a job effectively.

Call this skill level (S.L.)

3. The level of acquired knowledge needed to perform a job effectively

Call this knowledge level (K.L.)

4. The degree of responsibility demanded of the person performing the job effectively.

Call this responsibility level (RESP.L.)

5. The degree of discretion to be exercised by the individual performing the job effectively. The higher the degree of uncertainty and the greater the requirement for planning, problem-solving and decision making, the higher the degree of discretion and the higher the level of ability required

Call this discretion-level (D.L.)

6. Time span. The longer the time scale within which the individual has to work, the higher the level of ability required to perform the job effectively. Put simply, the further ahead in time the individual has to consider in acting today the greater the time span of the job.

Call this time span (T.S.)

5.2. Grading Scales.

In grading each job against the criteria set out above, it has been necessary to use a 7-point grading scale for each criterion.

A shorter scale is insufficient to make the degree of differentiation found necessary between jobs and a longer scale is difficult to use because the range of requirements in the W.E. up to but excluding managerial jobs is sufficiently low to make finer discrimination an arbitrary process.

Having agreed on the criteria and scale length, a method of paired comparisons is then used to determine where each job should be graded on each criterion. This leads to a rating (1-7) for each job on each criterion.

The final job grade is then determined by summing the ratings for each criterion.

Notes: For consistency of ratings, on all criteria except Routine Level (R.L.) grade are allocated 1 - lowest to 7 - highest.

For Routine Level (R.L.) the scale is reversed since the highest level of routine represent the lowest level of demand on the individual

The grading scales are therefor applied as follows:

	<u>HIGH</u>						<u>LOW</u>
Routine Level (R.L.)	1	2	3	4	5	6	7
	<u>LOW</u>						<u>HIGH</u>
Skills Level (S.L.)	1	2	3	4	5	6	7
Knowledge Level (K.L.)	1	2	3	4	5	6	7

5.3. The outcome from this process is that:

1. The grade of each job relative to the grades of all other jobs will become clear.
2. The grades of each job within a function of the W.E. will be known in relation to the grades of jobs in other functions.

It then becomes possible to identify:

1. Those jobs within the W.E. which are comparable in terms of the total demands made on the individuals involved.
2. The overall ability level considered necessary for effective performance in each job. For the Indonesian situation this will be expressed for recruitment and training purposes as an educational level.
This is not to suggest that manpower recruited for a given job should necessarily possess these qualifications, but rather that the level of ability should be sufficient to succeed at that level in the educational system.

Note 1.: Unless there are adequate means for testing ability levels, it may in practice be necessary to recruit from the educational system at the levels indicated.

Result are shown on the following pages.

5.4. THE GRADING OF PRODUCTION FUNCTION JOBS.

JOB /CRITERION R.L. S.L. K.L. RESP.L. D.L. T.S. TOTAL

Head Works Labourer	1	1	1	1	1	1	6
Water Treatment Plant Operator	1	3	4	4	1	1	14
Water Treatment Plant Technician	1	4	4	5	1	1	16
Water Treatment Plant Supervisor	2	5	5	6	4	3	25
Laboratory Assistant	1	4	4	4	1	1	15
Laboratory Technician	2	5	5	4	1	1	18
Plant Chemist	3	6	6	5	4	3	27

5.5. THE GRADING OF DISTRIBUTION FUNCTION JOBS.

A. Distribution System.

<u>Job/Criterion.</u>	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL</u>
Labourer	1	1	1	1	1	1	6
Patrolman	1	1	2	2	1	1	8
Pipe Fitter	2	5	3	5	1	1	17
Foreman Pipe Fitter	3	5	5	6	4	3	26
Distribution Supervisor	4	5	6	7	5	4	31
Plumber	2	5	4	4	1	1	17
Foreman Plumber	3	5	6	4	3	3	24
Plumbing/Leakage Inspector	4	4	5	4	4	3	24

5.6. THE GRADING OF WORKSHOP JOBS.

<u>Job/Criterion.</u>	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL.</u>
Labourer	1	1	1	1	1	1	6
Mason	2	4	3	1	1	1	12
Carpenter	2	4	3	1	1	1	12
Painter	2	3	3	1	1	1	11
Blacksmith	2	4	4	1	1	1	13
Joiner	2	5	4	1	1	1	13
Artisan Foreman	3	4	5	4	3	3	22
Artisan Supervisor	4	4	6	5	4	4	28
Mechanical Fitter	4	5	5	3	2	1	20
Electrical Fitter	4	5	5	3	2	1	20
Mechanical Foreman	5	5	6	4	3	4	27
Electrical Foreman	5	5	6	4	3	4	27
Mechanical Supervisor	6	6	7	5	4	5	33
Electrical Supervisor	6	6	7	5	4	5	33
Workshop Supervisor	7	5	6	7	5	5	35
Driver (Small Vehicles)	1	3	2	1	1	1	9
Driver (Heavy Duty Vehicles)	1	4	4	3	1	1	14
Transport Foreman	3	4	5	5	3	4	24
Transport Superintendant	4	5	5	6	4	5	29

5.7. GRADING OF PLANNING DEPARTMENT JOBS.

<u>JOB/CRITERION.</u>	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL</u>
Tracer	1	3	2	1	1	1	9
Draughtsman	4	5	4	2	2	3	20
Senior Draughtsman	4	5	5	4	3	4	25
Chief Draughtsman	5	5	6	6	5	5	32
Survey Labourer	1	1	1	1	1	1	6
Chainman	1	1	1	1	1	1	6
Instrument man	1	3	3	1	1	1	10
Surveyor	2	4	5	3	2	3	19
Senior Surveyor	4	5	5	4	3	4	25
Chief Surveyor	5	5	5	6	5	5	31

5.8. GRADING OF FINANCE DEPARTMENT JOBS.

<u>JOB/CRITERION.</u>	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL</u>
Billing Clerk	2	4	4	2	1	1	14
Accounts Clerk	2	4	4	2	1	1	14
Revenue Clerk/ Cashier	2	4	4	2	1	1	14
Budgeting Clerk	2	4	4	2	1	1	14
Office Assistant	3	4	5	3	2	3	20
Office Manager	4	5	6	5	3	5	28
Meter Reader	2	2	1	1	1	1	8
Senior Meter Reader	2	3	3	2	1	3	14
Meter Supervisor	3	4	4	3	2	4	20

Note: For all these jobs, the ability to read and write is essential, although the job skill and knowledge demands are in many cases quite low.

5.9. GRADING OF ADMINISTRATION DEPARTMENT JOBS.

<u>JOB/CRITERION.</u>	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL</u>
Office Cleaner	1	1	1	1	1	1	6
Messenger	1	1	2	1	1	1	7
Purchasing Clerk	2	4	4	2	1	1	14
Records Clerk	2	4	4	2	1	1	14
Personnel Clerk	2	4	4	2	1	1	14
Public-Relations Clerk	2	4	4	2	1	1	14
Clerk/Typist	2	5	4	2	1	1	15
Secretary	3	4	5	3	2	2	19
Shorthand Typist/Secretary	3	5	5	4	2	3	22
Telephone Operator/Receptionist	1	4	3	2	2	1	13
Office Assistant	3	4	5	3	2	3	20
Office Manager	4	5	6	5	3	5	28
Stores Labourer	1	1	1	1	1	1	6
Stores Assistant	1	2	3	1	1	1	9
Storeman	2	3	4	3	1	1	14
Stores Supervisor	3	3	5	4	2	3	20
Stores Manager	4	5	6	5	4	5	29

Note. Although clerk are identified by particular activity and therefor different skill knowledge requirements, the level of skill and knowledge is much the same in each case. They are therefor given identical ratings.

The grading of all higher level jobs, particularly those of senior management and highly trained specialist staff (e.g. graduate chemist, civil engineer, economist etc) should be done seperately.

In such cases the ratings on all criteria will be higher and will require the use of more extended scales. For example, a graduate bacteriologist who can conduct diagnoses of unexpected bacteriological conditions will have a much higher overall rating than the plant chemist. This will be for the following reasons:

1. Routine level

Although responsible for ensuring that routine testing is carried out, his job will involve analysis, interpretation, work scheduling, coping with staff problems, investigatory work etc.

The level of routine will therefore be very low.

2. Skill level.

The use of professional skills will be high as will skills associated with managing and developing junior staff.

3. Knowledge level.

Unlike the plant chemist, this person will almost certainly be a university graduate. As such he will be using a considerable amount of the knowledge gained during his degree programme. He will in addition be expected to acquire further knowledge specifically related to the water supply industry.

4. Responsibility level.

This person is accountable for the effective conduct of a vital function for perhaps a number of W.Es. He is in addition responsible for the actions of a number of other people. Responsibility level is therefore high.

5. Discretion level.

Although expected to work within the guidelines of established policy and procedures, he will need to make day - to - day decisions from the basis of his professional expertise. He will therefore have a considerable amount of personnel discretion in making judgements, and determining the best courses of action.

6. Time span.

The need for planning, work-scheduling, developing staff, etc. demands a forward-thinking approach.

Time span will be much longer than that for the plant chemist who is concerned only with day to day routine testing.

Apart from the differences in levels on the criteria illustrated it will be necessary to add experience level (E.L.) in determining the overall grading of managerial jobs.

The reason for this is that whereas at lower levels (for example mechanical fitter), the skills and knowledge are easily transferable to other organisations, managerial skills are to a greater extent organisation specific. The policy framework is specific to the sector, there are sector specific regulations and managerial practices etc.

5.10. POINTS TO CONSIDER IN USING THE GRADING SYSTEM.

5.10.1 Reporting Relationships.

Generally speaking, the organisation structure of any W.E. should reflect the grading system outlined. It should typically be the case that any individual will report to (i.e. be responsible to) someone with a higher grading. In particular, the responsibility level (R.L.) of a person with line management/supervisory responsibility should be higher than that of the individuals reporting to him.

5.10.2 Interpretation of gradings.

The higher the overall grading figure, the higher the general level of ability required of the individual doing the job.

It will be noticed that in several instances, a number of jobs have been given the same ratings on a particular criterion, even though the final overall grades allocated may differ significantly. The reason for this is best illustrated by example.

Consider the jobs of the mechanical fitter and the mechanical foreman.

	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL</u>
Mechanical Fitter	4	5	5	3	2	1	
Mechanical Foreman	5	5	6	4	3	4	

Both have the same rating on skill level (S.L.) - 5, although the jobs are qualitatively different in terms of the skills needed. Whereas the fitter requires technical skills appropriate to his particular specialisation, the foreman will not use those same skills even though he may possess them (i.e. he will have been a fitter before being promoted or appointed as foreman). Since the job does not actually require those skills to the same extent the job is given a lower grading on the technical skill component.

However the job of foreman requires the use of additional skills, including keeping attendance records and skills associated with handling people. Thus the reduced value of one set of skills is compensated for by the addition of new skills.

5.10.3. Individual Development Needs.

The differences in overall grading between two jobs, gives some indication of the extent to which development would have to take place, before an individual could move from one job to the other.

The differences in ratings on each criterion for the two jobs also suggest the directions in which most development effort will have to be put.

Again, consider an example.

	<u>R.L.</u>	<u>S.L.</u>	<u>K.L.</u>	<u>RESP.L.</u>	<u>D.L.</u>	<u>T.S.</u>	<u>TOTAL</u>
Water Treatment Plant Operator	1	3	4	4	1	1	14
Water Treatment Plant Technician	1	4	4	5	1	1	16
Water Treatment Plant Supervisor	2	5	5	6	4	3	25

It would clearly require less effort to train a treatment plant operator to be a treatment plant technician (14 ---- 16) than it would to develop the person to become a good treatment plant supervisor (14----- 25).

Where as the operator could be made ready to take on the technicians job with a combination of short training programme together with relatively short planned on-job experience, preparing him for the supervisory role would require more comprehensive Programme of Training.

Looking at the ratings on the individual criteria will give some idea why the operator/supervisor job gap is greater.

- R.L. Where the operator's job is one of following planned procedures on a regular basis, the supervisor's job is a little less routine. In particular he will sometimes have to deal with non-routine technical and people related problems.
- S.L. It is likely that the supervisor will have and occasionally use, all the operator and technician skills. In addition, he is responsible for ensuring that other staff carry out their jobs effectively, for motivating them and for developing the treatment plant team. His important additional skills are therefor associated largely with influencing, guiding and controlling other people.
- K.L. Whereas the operator and technician need to know only what to do and how to do it, the supervisor will in addition need to know why the various actions are taken in water treatment. The additional knowledge should be strictly limited to that needed to identify symptoms, diagnose simple causes and take action in relation to treatment plant operation.
- Res.L. The supervisor has direct responsibility for ensuring that water is treated effectively through the correct actions of other treatment plant staff. The operator on the other hand has no such responsibility. He is under the direction of the supervisor.
- D.L. The time scale for both the operator and technician jobs are short. Their concern is with what they are doing at the moment. Supervisor on the other hand needs to look ahead and consider the consequences of today's actions (or the failure to take actions) for tomorrow, next week etc. It is the failure to do so that has led to the deterioration of many existing treatment plants.

Looking at these differences, it becomes clear that developing the operator to a point when he could be promoted to supervisor is longer development task.

It is also a task which is best undertaken through carefully planned on-job experience, gradually giving the operator more responsibility, testing him out and then providing a formal training input.

It must of course be recognised that using the grading structure as a means of identifying development gaps is limited to jobs within a function which bear a logical relationship with each other. In addition the indications of when development effort needs to be directed is only a general one. Defining training needs operationally will have to be done by identifying differences through task analysis.

4. As indicated earlier, care should be taken in using the grading structure as the basis for determining salary levels. Although good enough for organisation structure design and establishing important reporting relationships, it is not sufficiently sensitive as a measuring instrument for setting reward levels. The further problem is that salaries are also determined by market forces.
5. Listed in the grading structure is the complete range of non-managerial jobs. In the smaller W.E. some of these jobs cannot be justified either on cost/effective use of manpower or need grounds.
6. The number of employees in each grade and job required by the individual W.E. is not easy to specify completely. A number of factor are involved, including.

- Treatment process
- Length of transmission mains
- Age of transmission mains
- Expansion plans
- Two or three shift operation

How ever, by reference to the sample organisation structures given in this report, to the technical specification of the W.E. and to specific work load consideration within the W.E., it should be quite easy to identify manning requirements.

It must be remembered that in determining the numbers of supervisory personnel required (i.e. supervisors and foremen) the general rule to be followed is that in a flow process technology situation, a supervisor can deal adequately with 8-10 subordinate staff.

OVERALL GRADINGS	PRODUCTION	DISTRIBUTION	WORKSHOP	PLANNING	FINANCE	ADMINISTRATION
42						
41						
40						
39						
38						
37						
36						
35			WORKSHOP SUPERVISOR			
34						
33			MECHANICAL/ELECTRICAL SUPERVISOR/SUPERVISOR			
32				CHIEF DRAUGHTSMAN		
31		DISTRIBUTION SUPERVISOR		CHIEF SURVEYOR		
30						
29			TRANSPORT SUPERINTENDANT			STORES MANAGER
28			ARTISAN SUPERVISOR		OFFICE MANAGER	OFFICE MANAGER
27	TREATMENT PLANT CHEMIST		MECHANICAL/ELECTRICAL FOREMAN / FOREMAN			
26		FOREMAN PIPE-FITTER				
25	TREATMENT PLANT SUPERVISOR			SENIOR DRAUGHTSMAN / SENIOR SURVEYOR		
24		FOREMAN / PLUMBING / PLUMBER / LEAKAGE INSPECTOR	TRANSPORT FOREMAN			
23						
22			ARTISAN FOREMAN			SHORTHAND TYPIST / SECRETARY
21						
20			MECHANICAL/ELECTRICAL FITTER / FITTER	DRAUGHTSMAN	OFFICE ASSISTANT / METER SUPERVISOR	OFFICE ASSISTANT / METER SUPERVISOR
19				SURVEYOR		SECRETARY
18	LABORATORY TECHNICIAN					
17		PIPE FITTER / PLUMBER				
16	TREATMENT PLANT TECHNICIAN					
15	LABORATORY ASSISTANT				BILLING CLERK / ACCOUNTS CLERK / REVENUE CLERK / BUDGETING CLERK	PURCHASING / CLERK / TYPIST / RECORDS CLERK
14	TREATMENT PLANT OPERATOR		DRIVER (HEAVY-DUTY)		SENIOR METER READER	PERSONNEL / STOREMAN / PUBLIC RELATION OPERATOR / CLERK / TELEPHONE OPERATOR / RECEPTIONIST
13			BLACKSMITH / JOINER			
12			MASON / CARPENTER			
11			PAINTER			
10				INSTRUMENT MAN		
9			DRIVER (SMALL VEHICLES)	TRACER		STORES ASSISTANT
8		PATROLMAN			METER READER	
7						MESSENGER
6	HEADWORK LABOURER	LABOURER	LABOURER	SURVEY LABOURER / CHAINMAN		OFFICE CLEANER / STORES LABOURER
5						
4						
3						
2						
1						
0						

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6. ORGANISATION STRUCTURES.

6.01. When considering the manpower/training requirements of water enterprises, it is first necessary to formulate an overall organisational structure, based on the actual work to be undertaken by the water enterprises. In this context "water enterprise" relates to any organisation (PAM, BEAM, PDAM, Dinas AM etc) entrusted with the supply of potable water to consumers. As stated earlier, the organisational structure must be based on the actual work to be undertaken by the enterprise-however, where the total work requirement cannot be fulfilled by directly-employed staff, either due to financial limitations or the availability of staff, alternative organisational structures have to be adopted, with work being undertaken by staff not directly employed by the enterprise.

6.02. From a brief review of current conditions within Indonesia, it would appear that highly qualified staff (particularly in the technical field) are unlikely to be obtained to staff all water enterprises scheduled to be established over the next decade. It is also apparent that the individual water enterprises would not be in a position to meet the cost of employing highly qualified staff, and providing the associated facilities. If the enterprise were able to afford the staff, it would not be able to usefully employ them, and there would therefore be a general loss to the country. The enterprises must therefore have access to the highly qualified staff, and supporting facilities, as and when required, on a part time basis. This suggests the formation of a group of specialists, who could be used to monitor and instruct the enterprise staff in the running of the enterprise.

The group of specialists should be located within reasonably easy access of the enterprises which they would be required to service, and indicate the selection of a larger enterprise to be in a position to assist smaller enterprises as and when required.

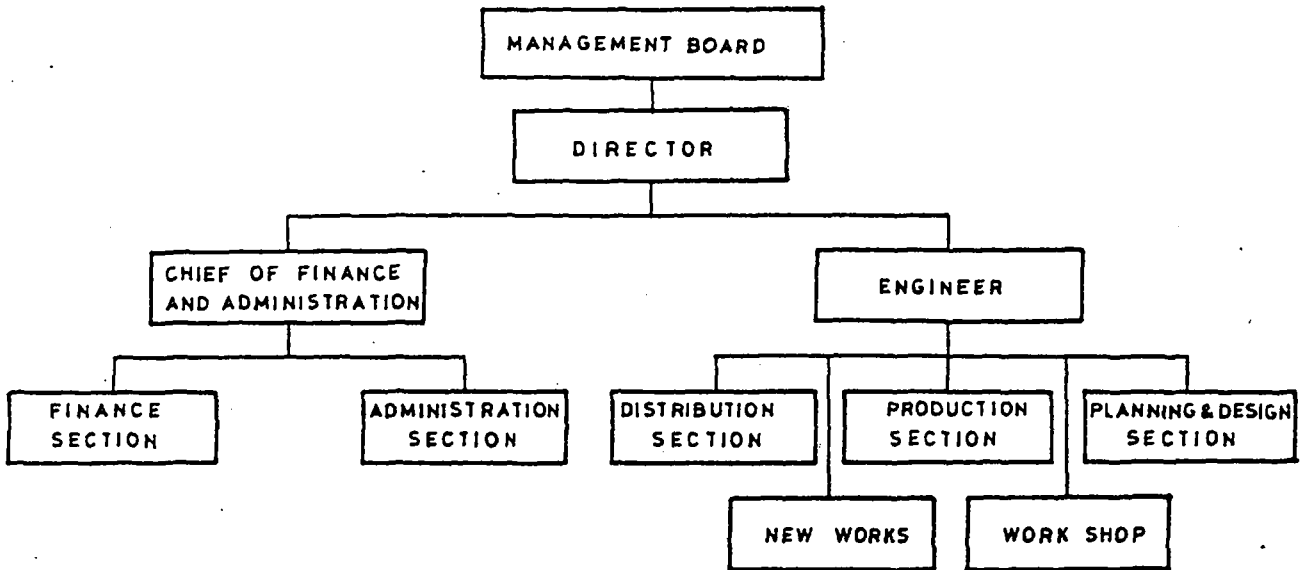


FIGURE.1

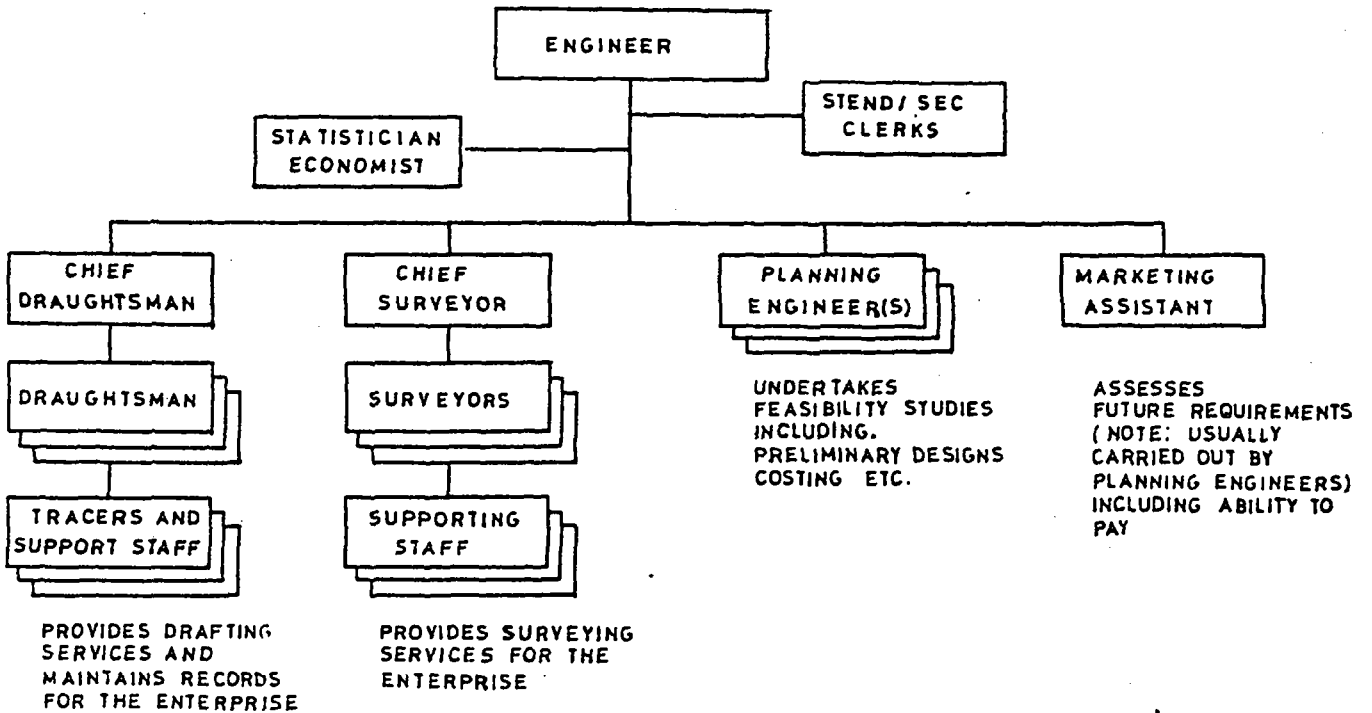


FIGURE.2

6.03. Based on the requirement that staff should be used to their maximum potential, salary and remuneration should be commensurate with the skills and responsibilities of each job, and similar work undertaken in various enterprises should attract appreciably the same remuneration. Opportunities for promotion should be afforded, both within the enterprise, or by movement between enterprises. Each job position should accordingly be established in terms of education, skills and experience required for the work to be carried out efficiently, and the scale of remuneration assessed. The manner in which promotion is effected can then be detailed in terms of additional knowledge required, and benefits to be obtained, related to the responsibilities of the position.

6.04. The overall organisation chart of each of the various water enterprises must be amended to suit the conditions existing at the enterprise, although similar enterprises will have similar organisations.

6.05. The general organisation as given in the Buku Pedoman is shown in Figures 1.

Each section will require to be staffed in accordance with the work to be undertaken, and the specific conditions existing at each enterprise, the organisation chart applicable being abstracted and used as appropriate:

6.06. Planning Section.

The work undertaken by the Planning Section includes maintaining records of existing works, i.e. demand, supply, "as built"

- drawings etc: and using these to forecast changes required. For small enterprises with limited development requirements, the

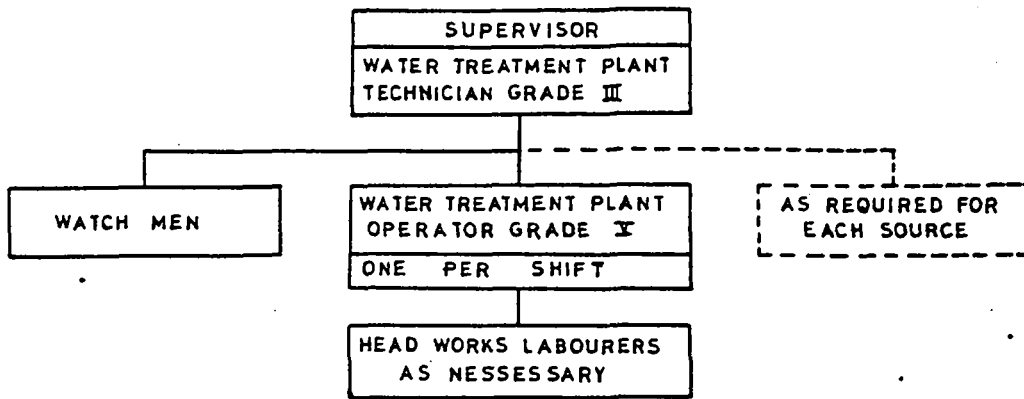


FIGURE.3

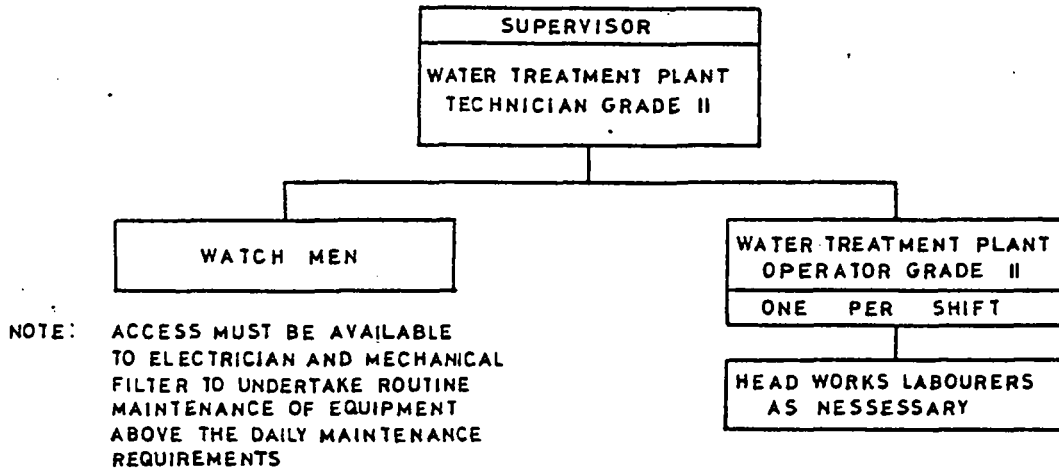


FIGURE.4

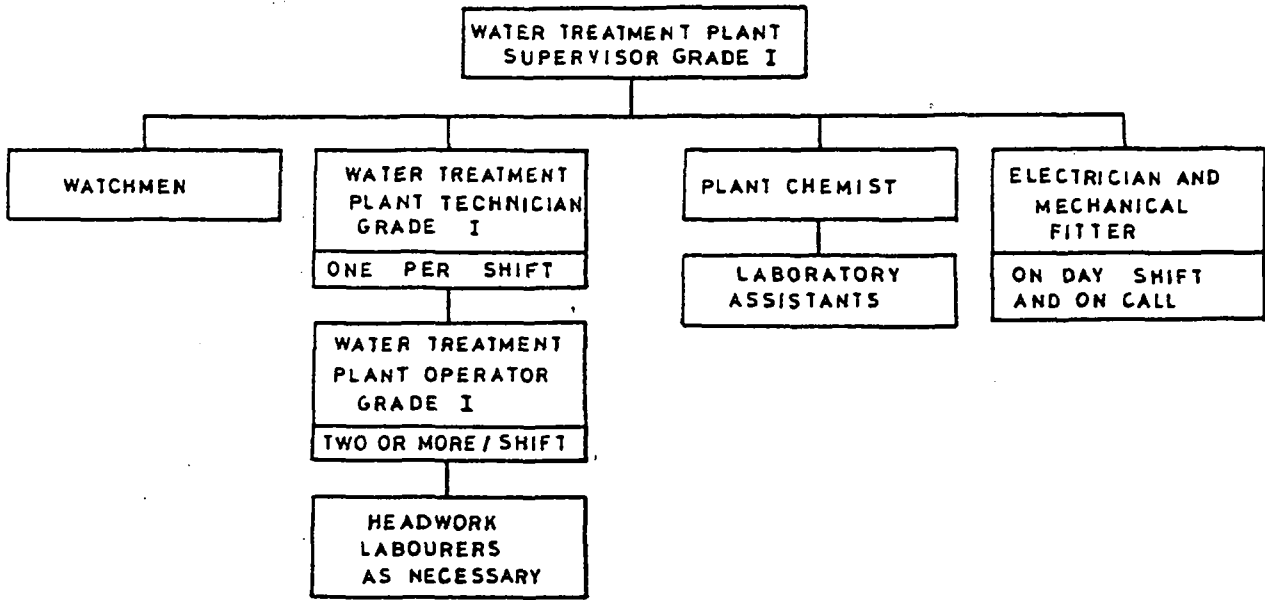


FIGURE. 5

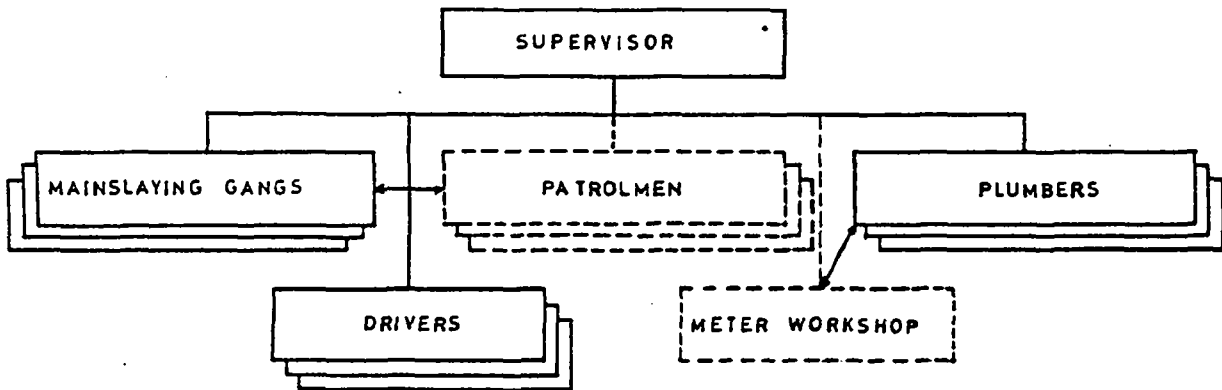


FIGURE. 6

technical requirements will be undertaken by the Engineer, with a draughtsman Grade I, II or III dependant on the work requirements. For a large enterprise, the section would require the staff shown in Figure 2, or a proportion of the staff, dependant on work load.

6.07. Production Section.

The work undertaken by the Production Section covers all sources of supply, and storage reservoirs. The staff requirements will vary according to the type, number and location of the various units.

(size does not materially affect the number of staff below 200 l/sec)

For small enterprises, the work of the production section can be readily undertaken by the staff indicated.

(a) With one or more spring sources, with disinfection (no pumping), in Figure 3.

The number of water Treatment Plant Operator Grade V will depend upon access & location, should the sources be widely separated it may be necessary to employ a supervisor for each source. Allowance must be made for leave, sickness and rosta change.

(b) With full treatment plant, capacity between 25 and 50 l/sec, with pumping plant/diesel generator, as shown in Figure 4.

(c) With larger treatment plants, e.g. in excess of 500 l/sec with pumping plant, as shown in Figure 5.

In small water treatment plants, the water treatment plant technician will supervise the treatment, i.e. make jar tests and check comparitor test and calculate chemical doses required, the water treatment plant operators making the required comparitor tests for routine control.

For large plants, dependant on complexity, the work may require a plant chemist and laboratory assistants to make the required tests. In the latter case full laboratory facilities also require to be provided.

8. Distribution Section.

The work of the Distribution Section covers all mains and consumers piping. The numbers of staff required will depend on the work programme of mains extensions and estimated consumer growth patterns. The section must also be staffed to undertake maintenance/repairs as required to both the mains and consumers' piping.

The organisation for all small enterprises will be similar to that shown in Figure 6.

The mains section undertakes:

All repairs to mains, valves etc

Mains laying for extensions.

Flushing/scouring of distribution system.

The duties of the patrolman are normally carried out by a pipe fitter from the mains section during slack periods. The patrolman is required to inspect all pipetracks and visible fittings for leakage (i.e. valves, airvalves etc). Also pipe track maintenance is generally carried out by the mains section during slack periods, and includes corrosion protection of exposed pipes and fittings.

The decision concerning whether the inspection and maintenance will be carried out by the mains section or a patrolman section can only be made on the basis of specific details of work load, lengths of mains and site conditions, at the individual enterprises.

For planning purposes, one mains laying gang should be able to lay, test and commission at least 40 metres of pipe per day, in "normal" conditions.

Flushing/scouring of the mains is also carried out by the distribution section, on a routine programme, the work is supervised by the supervisor, actual valve operation being carried out by the patrolman or fitter.

The routine chemical analysis, that is, checking pH and residual chlorine in the distribution system, taking samples before, during and after flushing, can generally be undertaken by the distribution supervisor, with assistance from the production supervisor if required.

Each mains laying gang will consist of:

- 1 Pipefitter (Grade according to size and types of mains in W.E.)
 - 2 Mason on call (for anchors, valve chambers etc)
 - 1 Carpenter on call (for formwork, timbering where necessary)
- Labourers (as necessary for size of mains in W.E.)

The consumers section undertakes.

Making connections to the main, and laying the communication pipe.

Installing the meter - disconnection

Inspecting the consumers' installation

Making repairs to communication pipes

In some W.E.'s the enterprises also instal the consumers' plumbing, including fixing of toilet fittings, so that this will obviously affect the number of plumbers employed by the enterprise.

The number of plumbers will depend on the work load. Generally 1 plumber should be able to arrange two consumers' connections per day,

i.e. complete excavation (drill and) tap main, lay communication pipe, instal meter and complete backfill. Obviously this is governed by conditions at site, including distance from base of the consumers' premises, means of transport, depth of main, type and size of main, and length of communication pipe (should the W.E. staff also undertake the installation of the consumers' piping inside the buildings, other factors are involved, such as number of taps/outlets, length of piping, fixing and making good etc). For statistical purposes;

1 plumber should be able to connect a minimum of 5 consumers per week, or 250 consumers per year. If the estimated growth is less than

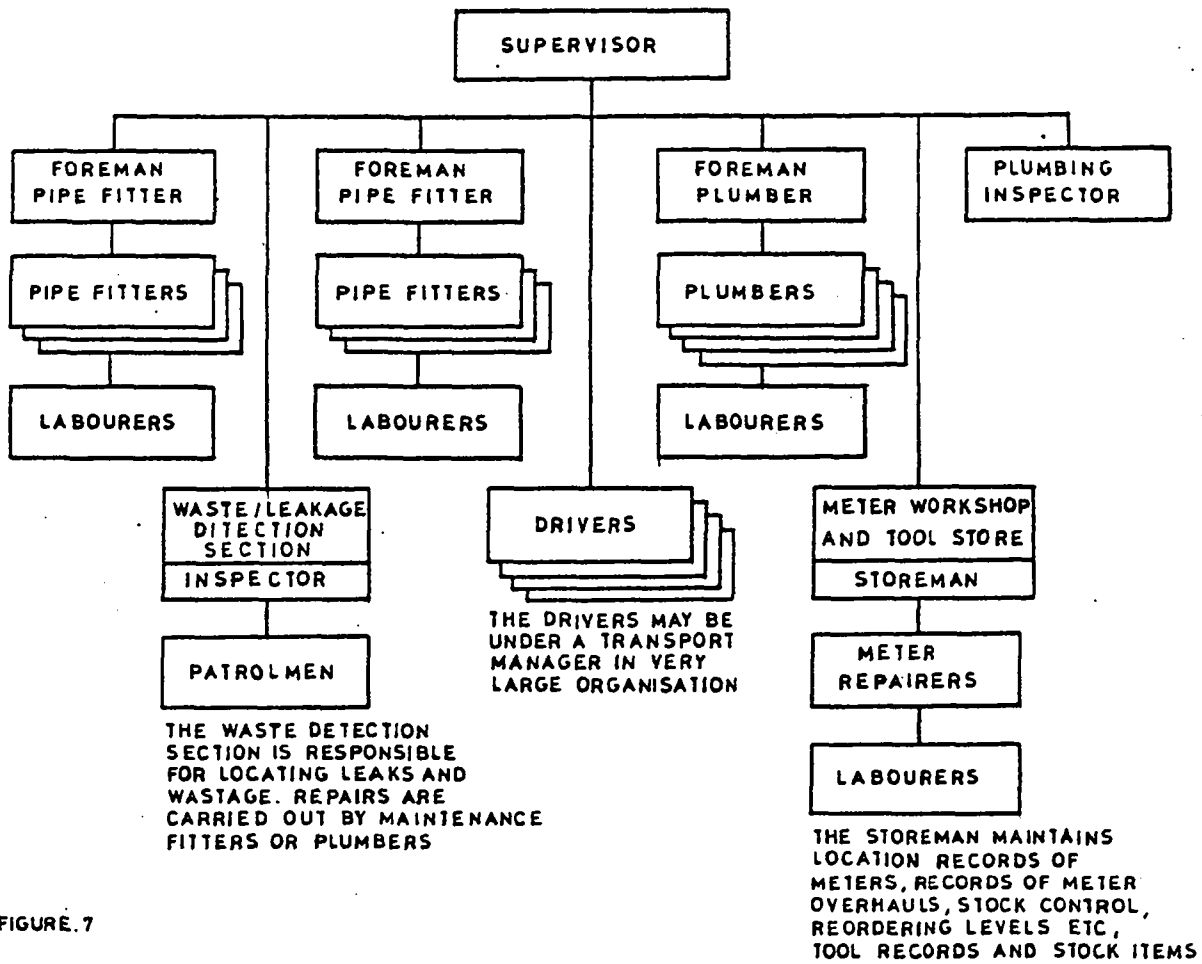


FIGURE. 7

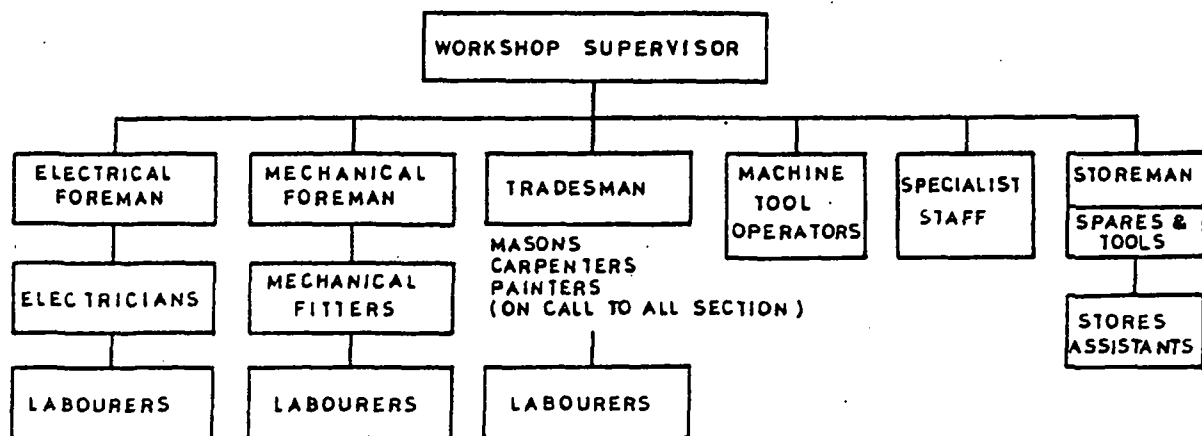


FIGURE. 8

this figure, the plumber will also be able to be usefully employed on other work. In addition the plumber will undertake repairs to consumers' piping in some enterprises, and to the communication pipe in all.

The organisation for large enterprises will be similar to that shown in Figure 7.

9. Workshop.

Workshop facilities are required according to the type of equipment held by the W.E. For small water enterprises, with limited requirements, it is uneconomical to have extensive and/or highly qualified permanent workshop staff, and in view of the limited facilities which are needed, they can either be within the Production Section or the Distribution Section, dependant on which section is the prime user.

The organisation chart for a workshop/for a larger enterprise would be based on Figure 8, the staff being selected to carry out the work required by the W.E. It must be noted that tradesmen such as masons and carpenters are shown under workshop, these being the same persons who are used for making anchor blocks, valve chambers etc. for the mains section. The mechanical and electrical fitters would also be used for work on plant at the production unit, but under the control of the workshop supervisor.

6.10. New Works.

For the smaller water enterprises, no new works other than mains extension would be undertaken by direct staff. Any new works required would be undertaken by specialists.

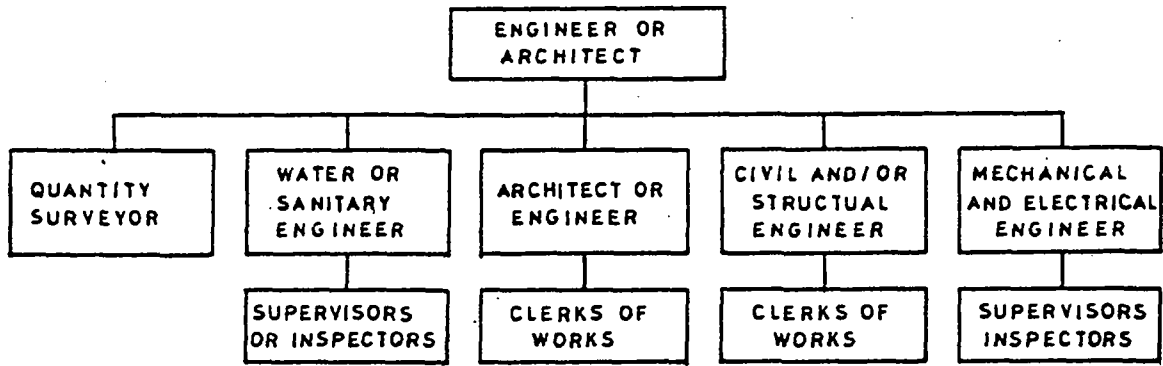


FIGURE. 9

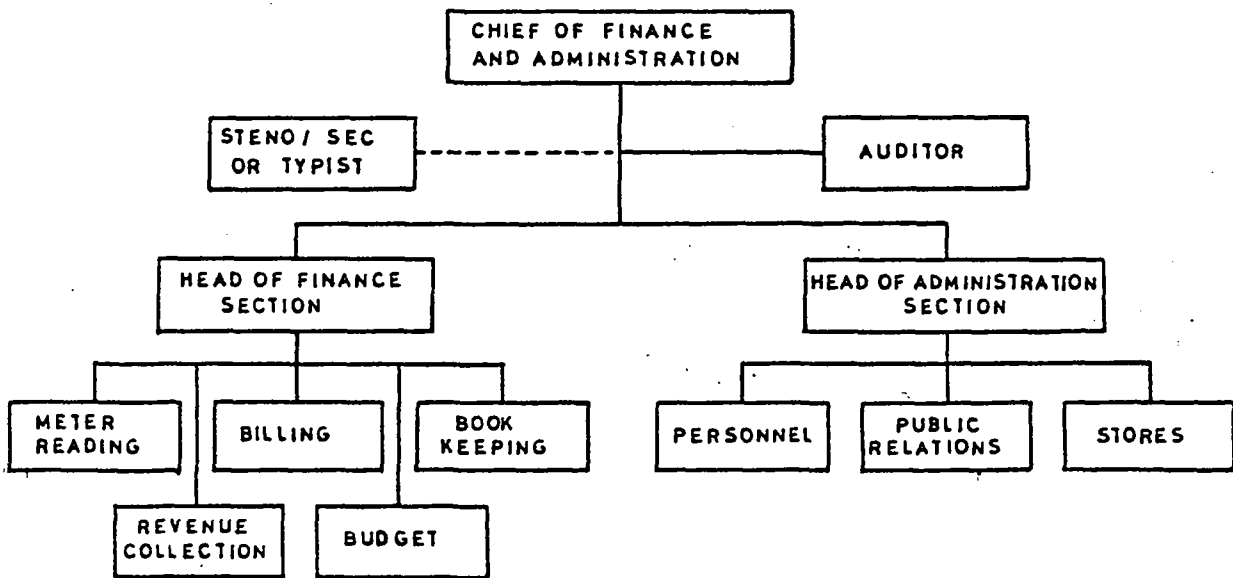


FIGURE. 10

For larger enterprises, the design may be undertaken by direct staff or handled by consultants, the organisation for direct staff being as shown in Figure 9.

It is unlikely that many of the water enterprises individually would have the financial resources or practical need to employ the staff necessary to undertake any major new works.

6.11 Finance and Administration.

The organisation required to carry out the financial and administration duties required at the enterprises can be standardised more readily than the technical staff requirements, due to the similarity of procedures, assuming the procedures outlined in the Buku Pedoman are followed. The basic organisational requirements are as shown in Figure 10.

The number of staff required to undertake work of differing sizes of enterprises is given in the Buku Pedoman, and is considered to be the number required to carry out the procedures listed therein.

The grades of the personnel required for differing sizes are to be assessed so as to provide incentives by way of promotion.

The requirements as listed in the Buku Pedoman, in accordance with the number of connection is as follows.

	1000	1000-2000	2000-5000	5000-10.000	10.000-15.000	15000-20.000
Book keeping	1	2	4	4-8	8-12	12-16
Billing	1-2	2-4	4-7	7-14	14-21	21-28
Revenue	1	2	3	3-6	6-9	9-12
Gen.Adm.	1	2	3	2-5	5-7	7-9
Purchasing	1	1	1-2	2-5	5-7	7-9
Stores	1	1	2	4	6	8

12. From the foregoing, major technical requirements for the operation and satisfactory maintenance of small enterprises would not be provided at the enterprise, but would be provided centrally at a large enterprise. The manner in which this could be financed is discussed later, but at present, the service is being provided by Cipta Karya staff based at the Provincial Centres. From discussions at site, this can cause delays in effecting necessary remedial action, the reason for the delays not being ascertained.

13. The main areas for which control services should be provided are as follows:

Laboratory Services: For all water enterprises, routine analysis should be taken to monitor the quality of the water supplied. The frequency and number of samples tested are related to the plant output/number of people served, as recommended by the World Health Organisation. As the work is required to safeguard the public health requirements, it is preferable that this is carried out by the Ministry of Health, in their laboratories, which require to be equipped to carry out bacteriological testing, as well as undertaking full chemical analysis.

The daily control of water treatment processes can be carried out by the water treatment plant operator/technician/supervisor, who will need to be able to carry out jar tests and comparator tests to determine the treatment required and to assess effectiveness of the treatment. The training requirement for this work would be two or three days for persons having the required basic arithmetical background. (The work at site is further simplified by the provision of nomograms). The actual design of the treatment process, including the initial decision on what chemicals are to be used, requires the services of a fully qualified water chemist, but would have been decided before construction of the plant.

The routine chemical and bacteriological analysis made to monitor and to verify that satisfactory treatment is being carried out, is covered partly by the testing proposed to be undertaken by the Ministry of Health. Other tests which require a fully equipped laboratory, highly trained laboratory technicians, supervised by a fully qualified water chemist required by the water enterprise would be obtained either from a contract laboratory or from a larger enterprise with these facilities.

It is also necessary for the enterprise to have access to a well equipped laboratory and experienced personnel, including biologist to give advice/instructions on action to take in the event of a radical change of water quality requiring a complete change of treatment, or to combat possible infestations/algae growths etc.

Workshop Facilities: The cost of fully equipping a workshop to carry out all the required work of a small enterprise would be high. The staff required would also require to be experienced and highly trained, but would not be fully utilised in the enterprise.

In some areas, workshop facilities may exist in the private sector, or alternatively, the suppliers of the equipment may undertake necessary repairs/overhauls.

This applies to all plant, including mobile as well as stationary plant. It is proposed that only maintenance/replacement repairs are carried out by the water enterprise staff, all major overhauls and major repairs being undertaken by a central team, or if applicable, by contract with the suppliers.

Standardisation as far as possible would obviously limit the specific training required by the mechanical/electrical/electronic staff, and the holding of emergency spares. Centrally located workshops would

require to be equipped with any specialist tools for all the equipment they are required to service, together with machine tools and appropriate service manuals. For work at site a fully equipped mobile workshop should be available. In addition, the workshop staff must have access to fully detailed "As Built" drawings of all water treatment plant installations, including electrical wiring diagrams, instrument and control details.

Waste/Leakage Detection.

For the smaller water enterprises, routine waste/leakage detection is generally undertaken by the mains section, and is primarily by direct observation only. Where excessive wastage is present, and cannot be detected by direct observation, waste metering should be able to be provided by a larger enterprise as a service. (When designing mains networks, consideration should be given to the possibility of later waste metering). The installation of the waste meters would be undertaken by the water enterprise mains laying gangs under the direction of the Waste Inspector from the larger enterprise, the equipment necessary provided on loan, should this be considered necessary due to large unaccounted for water percentages.

During any waste metering exercise, training would effectively be given to the "home" supervisor in waste detection by metering. Any leaks detected would of course be repaired in the normal manner by the "home" fitters and plumbers.

Meter Workshop.

Meter repairs to the modern type of small water meter are relatively simple, and require a minimum of specialist tools or testing equipment. For smaller enterprises, a small workshop could be equipped, and the meter overhauls/repairs carried out by a plumber trained to undertake the work. The general period between routine overhauls for modern meters is five years, and one man should be able to overhaul not less than 10 meters per day, or say 200 meters during an average month, or 2000 meters during a year. The alternatives are for the small enterprise to have meters repaired at a centrally located workshop, or to provide their own workshop facilities.

The decision should be made based on number of meters, availability of staff on a part time basis, distance to transport meters to a central workshop and necessary overhaul stock requirements.

The necessary meter records have to be kept at each water enterprise, so that if a decision is made to repair meters under contract, the meter records would most readily be maintained by the Administration Section.

At present meters are obtained by water enterprises without consideration of standardisation. Where feasible, meters should be standardised at each enterprise to limit the required holding of spares and specialist tools in local meter workshops. Any contract workshop established would require to hold stocks of spares for all types/sizes of meters, and any specialist tools required. Larger meters and special meters, e.g. recorders/integrators, require specialist attention to effectively carry out repairs, and should be checked and serviced at the required intervals.

Manpower Development.

In addition to the "technical" skills and services, it will also be necessary to set up a system of manpower development, as foreseen by the manpower development programme. This will be a service to the enterprises, the staff being located at the provincial centres. Training could be provided by personnel of the "specialists" organisations of the larger enterprises, the modules and manuals being available from the Provincial Development Assistants. The manpower development and training requirements will be the responsibility of the personnel section at enterprise level to determine, based on information received from the MDP and with assistance of the Provincial Development Assistants.

Inspection of the enterprises, including monitoring of the technical and administrative functions, should be the overall responsibility of persons not directly associated with the enterprise. As suggested earlier, for quality control and monitoring, the Ministry of Health would appear to be the best, for technical and administrative control and monitoring, a department of Cipta Karya, for financial control an external auditor should be appointed to carry out an annual audit, both financial and management.

The cost of the various services has to be met. As fairly large sums are being made available as loans/grants to the smaller enterprises for their development works, a percentage could be made available for the provision of the physical facilities required at the major enterprise together with the cost of training the required staff. The services provided to the water enterprises could then be made on a payment basis, an estimated annual expenditure being included in the various enterprises budgets, and reflected in the major enterprise's operating budget. An approach to this is currently existing in the relationship between the Project Manager of Cipta Karya in the Province and some of the enterprises being established, and between larger enterprises and enterprises within their vicinity, so that the concept is not new.

Alternatively a percentage of the W.E. operating budget could be levied for the service, this having the advantage that the enterprises would tend to request the services more frequently, but the disadvantage that it may be misused.

14. Details of the various job descriptions, including duties, skills and knowledge required are being established, to cover all the work requirements of water enterprises. Draft details of some of the Junior Staff are attached, together with the chart indicating the various career development opportunities. For any enterprise, it will be necessary to know what the requirements are, and the appropriate job description selected. The personal details of the person selected to undertake the work can then be compared to the job requirements, and the training need established. For junior staff positions, the required training materials will be available at Province level, and Training will be arranged by the Development Assistant, either in the water enterprise concerned or at a central water enterprise, dependant on type of training required, and numbers of persons requiring the training related to the facilities existing for the training. The most satisfactory person to undertake the training is the supervisor or skilled operator, and for this he requires training in instructional techniques, which would be preferably given at Province level, with upgrading courses arranged periodically. Training will also be undertaken by contractors in specific instances, e.g. after construction of water treatment plants, or installation of new pumping plant, in order to train personnel in the operation and maintenance of the specific plant and equipment. Persons joining any water enterprise can see possible career development opportunities fairly readily, either within the enterprise, or by moving to another enterprise with larger or more complex requirements. For example, a Water Treatment Plant operator Grade IV, can either be promoted within the enterprise to a supervising grade, or to a higher grade of water treatment plant operator by transferring to a water enterprise with a larger water treatment plant, after satisfactorily receiving the required additional training/knowledge. Entry requirements to any grade should be stated as either an educational level or an experience level.

Personal record sheets are required to be kept at water enterprise level, showing basic educational level, experience and training. Annual assessment reports should indicate whether the person is ready for promotion; or alternatively, whether additional or repeat training is recommended in connection with the currently occupied job.

15 In order to further detail the manner in which management decides on the required organisation, a typical organisation for a small enterprise (i.e. with between 2,000 and 5,000 connections, a water treatment plant with maximum capacity of 40 l/sec, assume no restriction on demand, operating 3 shifts, between 200 and 300 new connections per year, and between 5 and 10 km, pipe line extensions per year max size 12"), is shown at Figure 11. As the size of the enterprise increases, and work load increases, it will be necessary to increase the number of staff, which will result in promotions and changes in schedules. For example, for the quoted enterprise as shown in Figure 11, the plumber would be able to undertake the repairs and overhauls of the domestic water meters. As the number of new connections increase, the work load may be such that a man must be employed to undertake the repair of the water meters as his main assignment. As shown, the pipe fitter undertakes the required main laying for pipeline extensions, and also undertakes any repairs necessary, including the inspection of valve chambers etc. Should the work load increase, it may become necessary to either employ a patrolman, or another fitter, which are preferably obtained by internal promotion. Similarly, should the supervisor leave, it is preferable for his successor to be from the section, which then requires the "line" of training/promotions to take place, i.e. The fitter to supervisor, a labourer to fitter, and recruit a labourer. In the case of retirement and expansion, the training requirements and recruitment can be planned well in advance, and arrangements made accordingly.

For the smaller water enterprises, it is uneconomical, and as stated earlier, within Indonesia is likely to be impractical, to undertake all works required by permanently employed staff. The staff should accordingly be able to undertake all routine operational and simple maintenance requirements, but also have access to specialist staff as and when required.

16 Planning (and design) Section.

The planning section maintains records of supply, demand, "As Built" drawings etc, and is responsible for all drawing office work.

"New Works", for a small enterprise will be limited to mains extensions, and minor construction works for which the draughtsman of the planning section would prepare the required drawings to designs of either the Technical Manager or the Distribution Supervisor. The mains extensions should comply with a mains extension policy detailing the financial requirements for mains to be extended to serve customers. For major extensions, or works requiring additional expertise (e.g. a main crossing a major river, or where levels are not known)

the required assistance may have to be obtained either by contract, or from a larger water enterprise (a structural engineer or surveyor). As the work load for the planning section increases, it will be necessary initially to increase the number of draughtsmen, and also the requirement for surveyors. The number of mains extensions will increase, taking more of the "engineers" time in design, and also engineering planning will be required, so that a stage is reached where an engineer is required to head the section. The engineer will be required to carry out feasibility studies, including calculations in connection with any mains extensions policy, and preliminary designs. For large enterprises, the planning section would require the services of a statistician and economist and possibly a librarian.

The planning section is unlikely to require a full time engineer until the enterprise has about 10,000 connections.

17. Production Section.

The production section is responsible for ensuring that the water supply is made available in the required quantity and quality. The maximum quantity is obviously dependant on the source works, and it is necessary for the output to be determined and the required quantity produced up to the maximum output of the source works. The quantity required is most readily determined based on reservoir levels, the daily fluctuations in level generally being consistent over a time cycle in any supply area. Provided the demand is being met, all valves must be fully open, and production quantity can be determined at the source from the flow records.

Should the demand increase suddenly, or the pattern change, the reason for the change must be ascertained. The quality of the raw water generally varies between limits, the treatment being designed to produce a water of satisfactory quality (chemically and bacteriologically) from the available raw water, based on the known limits. The initial design of the treatment must be made after consideration of all factors, and is undertaken by a fully qualified chemist in a fully equipped laboratory before the plant is constructed.

After construction, further tests are made to confirm the required treatment. Following this, the production section are required to apply the treatment so as to meet required conditions, which are measured at the treatment plant in terms of turbidity, pH and residual chlorine.

The supervisor must be able to determine the required chemical applications to meet the required conditions with fluctuating quality of the raw water. The tests required are carried out using standard solutions prepared from the chemicals in use at the site, and a colour comparator using specially prepared reagents. The water treatment plant staff monitor the effectiveness of the treatment using a colour comparator. Additionally, full chemical and bacteriological analysis should be made at regular intervals, dependant on the source and extent of the supply. The full chemical analysis and bacteriological analysis requires a well equipped laboratory and a fully qualified chemist, which cannot be economically provided at the treatment plant for the frequency required, and should accordingly be undertaken by a separate laboratory on contract basis. Should the raw water quality change sufficiently to warrant a change in treatment, the contract laboratory should design the required changes, which may then require additional construction works which in turn may require consultants to be engaged to undertake the necessary design. In addition the water enterprise must be in a position to determine that the chemicals in use at the plant meet the requirements of their specification, which require the services of a fully equipped laboratory and qualified chemist. It is usually only necessary to spot check against supplies which are purchased usually once a year, the chemical requirements being obtained usually on an annual contract basis.

The production section may also be responsible for maintenance of reservoirs, i.e. routine cleaning, this depending on factors such as location, type etc. The main reason for this work being undertaken by the staff of the production section is that the staff should have been tested and confirmed as not being carriers of water borne diseases.

An increase in the work load of the production section, i.e. to increase the quantity of water produced, does not necessarily mean an increase in staff. If the increase is effected by increasing the number of shifts worked, say from two to three, the additional shift staff are required. Similarly if the increase is obtained by commissioning another source, then staff will be increased.

Where possible, an increased output should be obtained by extensions to the original works, in which case, except for very large increases, and provided the extensions are reasonably well planned no additional staff will be required.

As the output increases, the number of chemical analysis and bacteriological analysis increase, so at some stage, it is economic for the enterprise to provide full laboratory services. (As mentioned earlier, the monitoring required for the supply should be carried out by a separate organisation, say Ministry of Health).

The chemist would also be available for undertaking analysis for small water enterprises in the vicinity, until such times as the work load of his own enterprise fully commits his time.

An enterprise is unlikely to need the services of a chemist until the plant output exceeds 500 l/sec.

18. The Distribution Section.

The distribution section is responsible for distributing the water to consumers, and covers the mains and consumers connections. In order to achieve this the distribution section undertakes laying extensions to the distribution system and connecting consumers.

Provided the demand is being met, there should be no requirement for controlling the flow by manipulation of valves, i.e. valves are either fully open or fully closed. The distribution section is also required to maintain the system to minimise waste, misuse and contamination. In the small water enterprise, the pipe fitter usually undertakes mainslaying to meet the normal expansion requirements of the enterprise, as well as attending to all repairs required to valves and piping. As repair work cannot always be planned (e.g. in the case of a pipeburst) this may interrupt the mainslaying on planned extensions to the mains.

Any major extensions required, beyond the capabilities of the section, will require to be carried out under contract, unless sufficient work on a continuing basis is available to warrant the employment of more personnel. As the work load increases, more personnel will be required. Also generally larger pipes will be necessary, increasing the complexity of the equipment required, e.g. lifting equipment and trenching equipment. As longer lengths of mains have to be checked, and more valves inspected, a separate section is established for carrying out the inspections, with more sophisticated waste detection methods being employed if "unaccounted for water" figures indicate this is necessary. Also as more customers are connected, more repairs are necessary to customers' piping, so that a separate section may be established for undertaking repairs to the customers piping. Assuming an exponential growth factor, more plumbers will also be required for making connections, and inspection of consumers' installations may require a full time inspector.

With more consumers, and more meters, it becomes economical at some stage to establish a meter workshop, with full time meter repairers. This stage is unlikely to be reached until there are 5000 connections, assuming that the water supplied meets WHO standards and the meters in use are satisfactory, and have followed the manufactures recommended overhaul programme.

19. Workshop.

The workshop is responsible for undertaking all routine maintenance work of plant and equipment, as used by the enterprise. In general, for a small enterprise, the workshop would have little capital plant. The mechanical fitter and electrician would undertake routine maintenance and replacement repairs to plant and equipment. For major overhauls and repairs, the work would be carried out by contract, or the workshop of a larger enterprise. Unless there is a continuing need for specialist workshop staff, i.e. welders, machine operators, blacksmiths etc: any work requiring these trades would be carried out under contract. The mason and carpenter would work with the distribution section as required for building valve chambers, anchorblocks, hydrant foundations etc, but would also be used in the workshop for precasting meter boxes, making road barriers, as well as undertaking any minor repairs to building, etc.

The workshop will also generally be responsible for the control of drivers, and routine maintenance of the vehicles. The number and type of vehicles will of course depend upon conditions of service of the senior staff, but excluding any saloon cars for senior staff would most probably be a rough terrain vehicle (e.g. jeep) and two light trucks and one light lorry. No heavy duty vehicles, e.g. excavators, cranes, would be held by the enterprise, so that it would not be economical to establish a repair or overhaul workshop, and this work will require to be put out to contract.

The physical location of the workshop would preferably be at the Distribution Section Yard. Should the Water Treatment Plant be located near to the town served, it may be practically expedient to locate the workshop, and Distribution Section, adjacent to the treatment plant, the decision being based on many factors relating to communication and land availability.

The workshop is primarily providing a service to the other sections of the enterprise. Initially the workshop facilities will be limited, requiring few personnel and little equipment. As the enterprise expands, more mobile equipment will be necessary, and a stage is reached where it is economical to employ staff, and purchase equipment, to enable the enterprise to carry out its own major overhauls and repairs.

The predominate service is provided to the distribution section, and for very large enterprises would include, in addition to personnel vehicles, lorries, trucks and rough terrain vehicles, excavators, cranes, mobile compressors and associated tools, dewatering equipment and mobile generators. The actual requirements must be tailored to each specific enterprise, although generalities can be assumed in planning. As the plant holdings increase, it becomes economical and necessary to employ specialist tradesmen, in addition to the masons, carpenters, mechanics and electricians, and to include welders, blacksmiths, panel beaters, painters, equipment operators, machinists, vulcanisers etc.

An increase in the size of the enterprise also increases the number and size of buildings, so that a stage is reached where maintenance of the buildings requires a full time section on its own. This stage is reached earlier if the enterprise follows a policy of providing residential accommodation for certain categories of staff, and would necessitate the setting up of a property management section, or building maintenance section, either within the workshop organisation, or with its own management, controlling its own budget and maintaining its own stores. At that time, the section would require to be headed by an estate manager who would be experienced in property maintenance and development, possibly with an architectural background.

As the size of the enterprise increases, the output and complexity of the treatment works will increase, and will also increase the staff numbers within the workshop to undertake the maintenance of the plant and equipment. Generally, the requirements are considered together with the overall workshop staffing, the production section rarely requiring the attendance of a mechanical fitter and electrician permanently, unless the plant is very large or very sophisticated.

Within the Technical Section, there will be clerical duties to be performed, and clerk/typists will be required, who will be responsible for office routine, completion of typing (records and forms etc) and general correspondence.

A considerable reduction in work load can be achieved by careful design of routine forms to eliminate typing or clerical content, so that the forms can be completed by "source" personnel e.g. in the case of consumer application forms, by the plumbers and distribution supervisor.

20. Administration Section.

The administration section is responsible for maintaining personnel records, supervision of stores and general administration not directly associated with finance. Under personnel is included manpower development, i.e. determining training needs and staff requirements, negotiating with employees, establishing employment contracts etc. In addition, the administration section will be responsible for legal matters appertaining to the enterprise, and would obtain the services of a suitably qualified legal practitioner, as and when required, on a fee basis. The work of a small enterprise would most probably be able to be handled directly by the senior staff member, with one clerk, and access to a clerk/typist.

For the supervision, control of stores, including purchasing, arranging contracts etc, a storeman, stores assistant and two clerks would be required, although this number may be reduced if the stores procedures can be completed by the storeman.

As the enterprise grows the various functions of the administration section may be sufficient to warrant the attention of a specific person, for each function, for example: A clerk may be assigned to specifically maintain personnel records including planned development, and within the personnel section it may later be necessary to employ a training officer and staff to support the training function. "Specialist" people may also be necessary. e.g. Receptionist, Telephone Operators, etc.

With the increasing size of the enterprise the stores function becomes more complex both with regard to the complexity of the stores items, as well as the value of stores being handled. Chemicals, although purchased by the administration section would preferably be stocked at the water treatment plant. In view of the quantities being purchased, it would be necessary to appoint specific clerks to undertake routine purchasing, including preparation of contract documents, calling tenders and completing the procedures leading to the award of contracts. The purchasing section should maintain full records to enable stock and purchase planning to be effective.

21 Finance Section.

The financial section is responsible for accounting, revenue and expenditure control. The procedures are generally detailed in the Buku Pedoman.

For a small water enterprise, one clerk may undertake two duties.

The finance section will however grow in a manner similar to the administration section, with clerks being assigned to specific functions, and subsequently to a part of a specific function. Initially for a small enterprise, the meter readers will be directly under the supervision of the financial manager, but as the enterprise connects more consumers, it will be necessary to appoint staff to supervise the work of the meter readers.

As an illustration, for an enterprise with 5000 meters, 3 or 4 meter readers would be required, supervised by the head of department or senior clerk. With 15,000 meters, 10 or 12 meter readers will be required, and it will be necessary to appoint a senior water reader to effectively supervise the work, and ensure the work is efficiently carried out.

22. Auditor.

Routine checking that the necessary controls are being maintained should be carried out by the finance manager himself. For more detailed auditing, both financial and management, the enterprise would require to appoint a suitably qualified person on a fee basis.

23. The work to be undertaken by a large water enterprise, is basically the same as for the smaller enterprise, but increased both in volume and complexity due to the increase in sizes. As a water enterprise increases in size, there is a stage when it is economical to employ the specialists, even though they may not be fully occupied in work of the enterprise. At this time, the specialist can provide a service to some smaller enterprises as and when required. Each case has to be decided on its own merits, as many factors, e.g. cost, location, availability etc, have to be considered.

7. ACTION PLAN - DATA COLLECTION .

7.1. Interim Period.

With the completion of the M.C.S., it is expected that considerable progress can be made in collecting data during the period between the two visits of the manpower consultant. This covers a 2-month period between the end of April and the end of June.

Data collection should be made in two important areas. The first is to provide reasonably accurate forecasts of manpower recruitment and training needs in those provinces where major works are being undertaken. The second is to help the manpower consultant develop the manpower planning model for the sector on his return to Indonesia.

It is hoped that the M.D.P. staff and Provincial Development Assistant will represent the manpower resources for this fairly routine but critically important activity .

A two-day seminar to explain the design of and outputs from the M.C.S. has already been held for the above staff. With the following notes it should be possible for them to undertake the first and most important part of this interim period project work without too much difficulty once a little experience has been had.

For the second part of the work, it is simply necessary to follow the questions as set out in the interview schedule set out below translated into Bahasa Indonesia and has been tested out successfully in W.E.s.

Specific data requirements are set out below:

7.2. RECRUITMENT/TRAINING.

Organisation of training in the provinces is dependent on the numbers of people who will have to be recruited and trained in order to satisfy the operational requirements of W.E.s. Recruitment will have to take place in sufficient time to allow for training to be undertaken before the manpower is required in the W.E. Close liaison, will therefor be needed between the D.A.s and provincial project managers/consultants..

Two kinds of situation should be considered at the present time:

- (a) The new project
- (b) The existing W.E. which is undergoing a programme of expansion.

7.2.1. The New Project.

Data needs here include:

1. Given the size and specification of the W.E. (e.g. package treatment plant, simple chemical process, expected workshop facilities, etc) how many staff in each of the grades specified will be needed to run the W.E?.

This can be determined by reference to the grading structure (section 5 of this report) and the recommended organization structures (section 6 of this report).

The best approach will be to consider each function separately :

e.g (a) Production.

Manpower requirements

- HEADWORKS

- TREATMENT

- TESTING

- MAINTENANCE

- (b) Distribution
- (c) Planning
- (d) Finance
- (e) Administration

Guidelines are given in the section on organisation structures as to how decisions about manpower needs might be made, given the specific circumstances of a W.E.

2. When will the manpower be needed? For each project, discussion with provincial project manager and consultants should provide sufficient information of timescales involved for recruitment and training. This information should be attached to the manpower forecasts for each project.
3. Details of any staff already recruited and likely to be retained by the W.E. when it becomes operational. Information should be included giving details of any training which these people have been given.
4. Having dealt with each project separately, the total manpower requirements for projects in the province should be determined.

7.2.2. Existing W.E.s - Expansion Programme.

Many existing W.E.s are the subject of fairly extensive expansion programmes at the present time. The D.A.s task will be slightly more complex in dealing with these because it will be necessary first to review existing manpower levels.

Data needs here will include:

1. Determine existing manpower in each function of the W.E. This can best be done by obtaining a detailed organisation chart which clearly states the job each employee does.
2. Determine the total manpower requirements for the expanded organisation following the procedures set out under 7.2.1 above for new projects.

7.2.3. Recording Data.

All data collected should be clearly identified with the name of the project/W.E. It is most important that all data be clearly recorded in writing.

When data collection is completed, details should be sent to M.D.P.

It is strongly recommended that some guided practice be given at the earliest possible stage to all Development Assistants by M.D.P.

Specifically, it is suggested that the D.A's together with MDP project manager and programme manager visit a new project and an expanding W.E. together.

The purpose should be to:

1. Go through the above procedures step by step
2. Demonstrate how the grading system and organisation structures section of this report can be applied to the diagnosis of manpower needs.
3. Produce an example of needed manpower requirements as set out above, which will allow questions to be raised and for any uncertainties about the interpretation of information to be dealt with.

The information needed is set out in the interview questionnaire below.

7.3.1. INTERVIEW QUESTIONNAIRE.

(a) Age of Employees.

What is the age (or date of birth) of each employee in the W.E. It will also be necessary to know what each persons job is. This can be prepared as follows:

<u>Name of Employee</u>	<u>Job of Employee</u>	<u>Section</u>	<u>Age</u>	<u>At what Date did He Join The W.E.</u>	<u>At what Date did He start The Job He is doing Now.</u>
-	-	-	-	-	-
-	-	-	-	-	-

(b) Salaries.

Would you please give us as much information as possible about basic salaries, incentive payments, and other payments to employees of the W.E.

(f). Performance Appraisal.

- (i) Which employees of the W.E. are responsible for carrying out performance appraisal?
- (ii) What are the results of performance appraisal used for.

(g). What training programmes have been designed and held within the W.E.

(h). How many people have left the W.E. or retired in the last 5 years.

<u>Name</u>	<u>Job position</u>	<u>Reason for leaving</u>	<u>Date of leaving</u>
-	-	-	-
-	-	-	-
-	-	-	-

(i). Replacement Staff.

When a person leaves the W.E. how is he replaced. For example, by promotion from within the W.E. or recruiting from outside the W.E.

To help DA's collect manpower data it is suggested that the following procedure is followed.

- 1). Since Daru of MDP has already been involved in collecting the above data, it is recommended that he visit each DA in each of the 10 provinces and that both should arrange to collect the above manpower data together from one established W.E. in the province.
- 2). The D.A.'s will then visit one or two other W.E's in the province for the same purpose.

8. SUMMARY

- 8.01. The objective in developing a manpower classification system is to provide a basis from which systematic recruitment and training can be undertaken to ensure that the skills, knowledge and behaviours needed for the efficient and effective functioning of the enterprises are available when needed.
- 8.02. To do this, it is necessary to identify all necessary functions to be completed by the enterprise, and to develop organisational structures to effectively and efficiently carry out the functions. The required functions are divided into tasks which can be undertaken by individuals within the organisation, and the necessary skills and knowledge required to carry out the work can be identified.
- 8.03. Once the required skills and knowledge required has been identified, the necessary training requirements for the job holder can also be detailed.
- 8.04. For small water enterprises, it is uneconomical both in terms of manpower and equipment for staff to be employed on a permanent basis to undertake specialist tasks which are only required infrequently. Such specialist services must be obtained by the W.E. either by contract or by the use of personnel and equipment from a Provincial Centre.
- 8.05. The jobs are arranged to provide easily seen career development opportunities for each grade. It is therefore necessary that remuneration is made commensurate with the requirement for skills, knowledge, and responsibility, attached to the job. Succession planning is necessary to ensure that as far as possible, internal promotions are established.

- 8.06. Supervisory functions must be clearly defined, and the persons undertaking this work should be recruited based on having the characteristics necessary for successful supervision. Training for supervisors should be directed specifically toward developing the skills and knowledge of the supervisory process.
- 8.07. A good performance appraisal system must be established to facilitate in the selection of supervisors and for succession planning.
- 8.08. The manpower classification system will be used to determine training needs of the individuals to equip them with the necessary skills and knowledge to carry out the required tasks efficiently and effectively. The manpower classification system will apply to any organisation responsible for supplying potable water.
- 8.09. Each position in the water enterprise will be given a title, the duties and tasks to be performed, the knowledge required to undertake the duties efficiently, and information which would be useful, to whom the holder reports, and for whom he is responsible.
- 8.10. A grading structure is then developed to determine the grading of each job relative to other jobs in the enterprise, so as to give an indication of relative remuneration levels.
- 8.11. Organisational structures can then be developed based on the work requirements of the specific enterprise, in terms of treatment processes, distribution system, and expansion. The manpower requirements to meet the work requirements can then be obtained both in terms of current needs, and in terms of future requirements due to staff movements (retirements, wastage etc) and expansion, including the establishment of new enterprises.