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ENTERPRISE PERFORMANCE DEVELOPMENT

Drs. H.A. Heckman

December 1981

ASIAN INSTITUTE OF TECHNOLOGY
BANGKOK, THAILAND

INTERNATIONAL WATER SUPPLY CONSULTANTS
PT UNISYSTEM UTAMA (LTD)
RESEARCH, INVESTMENT, MANAGEMENT
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A N N E X :

- I. TERM OF REFERENCE NATIONAL MANPOWER DEVELOPMENT PROGRAM, INDONESIA
- II. GUIDELINES FOR THE DEVELOPMENT OF A RELEVANT SET OF PERFORMANCE INDICATORS
- III. EXAMPLE USE PERFORMANCE INDICATORS
- IV. PORTEFOLIO TECHNICAL INSTRUCTION SHEETS
- V. TIPS ON DECIDING KEY POINTS
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F I G U R E :

1. Internal Matrix
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1. INTRODUCTION

1.

This paper deals with a methodology called ENTERPRISE PERFORMANCE DEVELOPMENT (EPD), which can be used to develop sound operations (in the widest sense of the word) within (Water) Enterprises. It is a methodology presently designed and implemented in Indonesia dealing with establishing new or upgrading existing Water Enterprises for urban water supply.

EPD is defined as a DEVELOPMENT PROCESS which enables the Management of a Water Enterprise to attain systematically performance levels set previously. As such, it is a form of ORGANISATION DEVELOPMENT. Consultants, either external or internal, only function as catalysts, change agents, contributing, whenever required, the necessary materials to sustain the development process.

The contents of this paper are subdivided as follows :

- challenges and constraints a Water Enterprise must face; the setting (chapter.2);
- the contents of EPD, the how and why (chapter.3);
- conclusions and recommendations (chapter.4).

This paper aims to be as specific as possible and deals mostly with the how and why of EPD. For the interested reader, reference is made during the text to relevant literature while a bibliography is included for further reading.

2. THE SETTING OF WATER ENTERPRISES IN A DEVELOPING WORLD

2.1. THE CONCEPTUAL FRAMEWORK

Before we set out on the how and why of EPD, it is useful to analyze first the challenges and constraints a Water Enterprise is most likely to face. For this analysis, we limit ourselves to Water Enterprises operating urban water supply systems in developing countries.

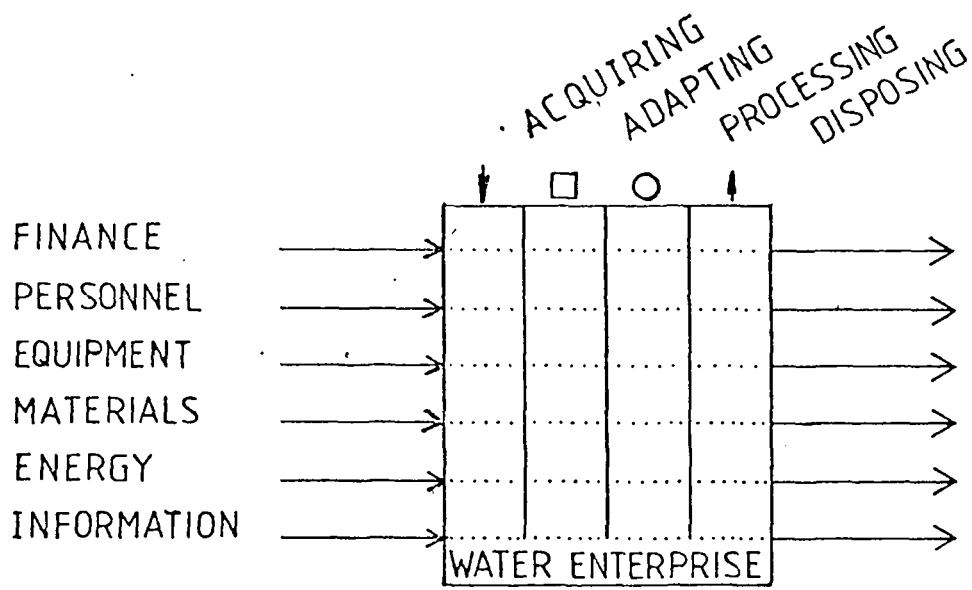
For our analysis we make use of a flow model which has been applied successfully to analyze production systems (E.J. de Bruijn and B. van Bronckhorst, 1980). We assume that a Water Enterprise can be described in terms of transformations of flows, in this case 6 flows, viz.

- finance
- personnel
- equipment
- materials
- energy
- information

These flows will be used to study the internal and external functioning of the Water Enterprise.

We assume further that the flow within the Water Enterprise are transformed in 4 stages, viz.

- acquiring
- adapting
- processing
- disposing.



FLOW MODEL OF A WATER ENTERPRISE

Herewith we are able to describe the internal functioning in an activity matrix which we call the internal matrix (refer to fig. 1.).

Next to the internal matrix, an external matrix is designed which relates the flows to those entities outside the Water Enterprise which are considered to influence its performance significantly, viz.

- financing sources
- labour market
- suppliers of equipment, materials, energy and information
- consumers
- government
- sector
- trade unions
- education
- miscellaneous organisations.

Fig. 2. gives the external matrix.

The aggregation of the internal and external matrixes can be used to describe the performance of a Water Enterprise.

2.2. A TYPICAL SETTING

2.2.1. General

The concepts developed in para. 2.1. have been worked out for Indonesian circumstances and are given in figs. 3 and 4. Before elaborating on the results, it is useful to supply some background information on the Indonesian water supply sector.

Figure 1. Internal Matrix

Stages Flows	1. Acquiring ↓	2. Adapting □	3. Processing ○	4. Disposing ↑
1. Finance				
2. Personnel				
3. Equipment				
4. Materials				
5. Energy				
6. Information				

Figure 3. Internal Matrix

Indonesian Water Sector

Stages Flows	1. Acquiring ↓	2. Adapting □	3. Processing ○	4. Disposing ↑
1. Finance	W.E. unable to obtain Financing (insolvable) Subsidized by Gov't Consumers pay badly	Financial planning and budgeting underdeveloped No reservations (depreciation). Relations water rates/costprice absent	Elaborate accounting systems. Administration functions as registration, not as "tool of management". Effective control poses problems.	Possibility for staff bonuses/premiums not fully utilized
2. Personnel	Skilled personnel not available 10 WE. Salary level not attractive	Lack of appropriate training. No systematic manpower development. Safety aspects ignored. Salary level does not motivate.	Tasks ill - or not defined	Personnel difficult to dismiss
3. Equipment	W.E. is not involved in design and installation of larger projects. Spare parts sometimes difficult to obtain.	Essential data on equipment lacks. Planned maintenance absent. Repair tools insufficient. Knowledge to recognize technical troubles at an early stage lacks. No attention for storage. No standardisation	Clear instructions on use equipment absent. Equipment works at low efficiency.	
4. Materials	Raw water quality fluctuates strongly.	Unclearity on water quality standards.	Intermittent operations	Discontinuous delivery Deterioration in water quality during transport. Distribution system difficult to operate due to consumer interferences.
5. Energy	Regular power failure Electricity expensive Electricity is obligatory			
6. Information	General lack of information - technical operations - equipment - marketing No institution available which can act as counselor	No policy on data requirements. Very limited documentation	No systematic data collection on technical activities	Reports incomplete No systematic information of consumers

Figure 4. External Matrix Indonesian Water Sector

	Financial Sources	Labour Market	Suppliers of : Equipment Materials Energy Information	Consumers	Government	Sector	Trade Unions	Education	Miscellaneous Organizations
1. Finance	W.E. unable to obtain financing (insolvable) subsidized by Gov't	Salary Scales too low to attract sufficiently skilled staff		Reluctance to pay	In practice only source for finance. Water rates are determined more on political than on economical motives	Cross subsidy limited to districts			
2. Personnel		Lack of skilled labour, supervisory staff and specialists		Staff does not demonstrate enough a public serving attitude	Personnel labour conditions based on government regulations	Systematic Man-power Development within the Sector not operational		<ul style="list-style-type: none"> = Formal education does not comply with the needs of water Enterprises. = Opportunities/ Resources direct training staff limited, in some cases not directed at training needs = Self development of staff members not catered for 	
3. Equipment	Donors occasionally demand certain standards which need not comply with the already present equipment		Spare parts difficult to obtain after - sales service limited		Policy towards standardisation under developed				
4. Materials				Consumer regularly do not accept water quality (taste of chlore etc.)					
5. Energy			Electricity Rates high. Regular power failure		Obligation to use the electr. network whenever possible.				
6. Information			Lack of reliable information on - technical operation. - equipment Available information often in English (not accessible for the majority of staff).	Lack of information on Consumer Behaviour	Systematic information forwarding system lacks	Systematic information forwarding system lacks		Lack of information on existing educational facilities	No institute available which can act as counselor



5.

It was estimated in 1977 that Indonesia had a total of over 200 urban water supply systems. Many of these were subject to intermittent operation because of inadequacies in treatment, storage or distribution. In some cases, although fewer than the above, source deficiencies or excessive leakage of water caused interruptions to supply. Except in a very few cases, the operations of water treatment plants was below standard and this had led to an inefficient use of chemicals and the distribution of water of poor quality. The ability of the Ministry of Health to control the quality of water was hindered by both the lack of laboratory facilities and trained and experienced personnel. In 1976 it was estimated that some 35 percent of the total urban population was supplied by piped water supply of which perhaps only 50 percent was supplied by house connections.

Faced with this situation, the Government of Indonesia has decided on a major expansion of urban water supply facilities. During the period 1979-1984 (the Third Five-year Plan), it is planned to carry out a program of urban water supply development in 200 Indonesian cities with priorities given to network rehabilitation, leak detection, distribution system extension and to developing the local technical capacity for implementing schemes. The program for the 200 cities will comprise :

10 large cities	: 500,000 - 1,000,000 inh
40 medium sized cities	: 100,000 - 500,000 inh
150 small cities	: less than 100,000 inh.

It is planned that by 1984 a piped water supply will be available to 60 percent of the population in these cities. In addition, a program to bring piped water supply to each

6.
capital of the 4,000 sub-districts in Indonesia has been established.

To handle this strong increase in volume, a number of special arrangements exists. The Ministry of Public Works through its Directorate General Cipta Karya (i.c. the Directorate of Sanitary Engineering) has been made responsible for the design and construction of urban water supply schemes and the training of personnel in the urban water supply sector, if such schemes are financed by Government funds. To facilitate a systematic manpower development, a National Manpower Development Program has been established under the auspices of the Directorate General of Cipta Karya¹.

One project per Province has been created which is responsible for the design and implementation of the water supply schemes and the performance of the subsequently established water supply organisation within the Province. It is policy that water supply schemes should be run by self-sustaining organisations which are managed on commercial principles. Such a Water Enterprise is controlled by the District (read Ministry of Internal Affairs) in which it is located, and is responsible to the District for its financial operations. The District may receive a prior stipulated part of the surplusses and should cover deficits.

A temporarily arrangement known as Water Supply Management Board has been created in which the Directorate of Sanitary Engineering will assume full responsibility, including financial, for the starting-up period of such a Water Enterprise. During this stage, the Water Enterprise is organically part of the Directorate.

1. Refer to Annex I for the Terms of Reference of this program.

7.

However, as soon as the Water Enterprise will reach the financial break-even point, it should be transferred to the District. In general, one Water Enterprise will manage all urban water supply schemes within a District (cross subsidy).

The Ministry of Health is responsible for water quality aspects.

2.2.2. The Indonesian setting

The internal and external matrixes (refer to figs. 3 and 4). give only a number of symptoms. It becomes now "art" to establish the relations between them, identifying the underlying problems and to identify the problems which can be tackled within our scope. This has been done in figs. 5 and 6, in which we have identified 3 clusters, viz.

- cluster 1. : personnel
- cluster 2. : operations
- cluster 3. : consumers

Means to overcome these "problems clusters" might be :

- personnel : - lower required input levels by systematic manpower development;
 - obtain a more competitive position on the labour market and better motivation for staff by designing bonus/incentive schemes;
- operations: - provide the necessary skills and know-how for operations by detailed documentation of all routine tasks and systematic introduction of this documentation.
- consumers : - create a better understanding by systematic informing of the public;
 - satisfy the consumers by improving the performance.

Figure 5. Internal Matrix

Indonesian Water Sector - Problem Clusters

Stages Flows	1. Acquiring ↓	2. Adapting □	3. Processing ○	4. Disposing ↑
1. Finance	W.F. unable to obtain Financing (insolvable) Subsidized by Gov't Consumers pay badly			Possibility for staff bonuses/premiums not fully utilized
2. Personnel	Skilled personnel not available Salary level not attractive	Lack of appropriate training. No systematic manpower development. Salary level does not motivate.	Tasks ill - or not defined	
3. Equipment		Essential data on equipment lacks. Planned maintenance absent. Repair tools insufficient. Knowledge to recognize technical troubles at an early stage lacks. No attention for storage. No standardization	Clear instructions on use equipment absent. Equipment works at low efficiency.	
4. Materials		Unclearity on water quality standards.	Intermittent operations	Discontinuous delivery Deterioration in water quality during transport. Distribution system difficult to operate due to consumer interferences.
5. Energy				
6. Information	General lack of information - technical operations - equipment - marketing No institution available which can act as counselor	Very limited documentation	No systematic data collection on technical activities	No systematic information of consumers

Figure 6. External Matrix Indonesian Water Sector - Problems Clusters

	Financial Sources	Labour Market	Suppliers of : Equipment Materials Energy Information	Consumers	Government	Sector	Trade Unions	Education	Miscellaneous Other
1. Finance	W.E. unable to obtain financing (insolvable) subsidized by Gov't	Salary Scales too low to attract sufficiently skilled staff		Reluctance to pay					
2. Personnel		Lack of skilled labour, supervisory staff and specialists		Staff does not demonstrate enough a public serving attitude	Personnel labour conditions based on government regulations	Systematic Man-power Development within the Sector not operational		<ul style="list-style-type: none"> = Formal education does not comply with the needs of water Enterprises. = Opportunities/ Resources direct training staff limited, in some cases not directed at training needs = Self development of staff members not catered for 	
3. Equipment									
4. Materials				Consumer regularly do not accept water quality (taste of chlorine etc.)					
5. Energy									
6. Information			Lack of reliable information on - technical operation. - equipment Available information often in English (not accessible for the majority of staff).	Lack of information on Consumer Behaviour		Systematic information forwarding system lacks		Lack of information on existing educational facilities	

3. THE HOW AND WHY OF ENTERPRISE PERFORMANCE DEVELOPMENT

3.1. ENTERPRISE PERFORMANCE DEVELOPMENT AS A PROCESS.

In this chapter, we will set out to describe EPD first in total as a process, followed by a detailed description of each stage. As with icebergs, the majority of the activities necessary for a succesful implementation of EPD remain invisible for the spectator. Many materials need to be prepared prior to the introduction of EPD and they deal a.o. with the desired performance levels (model Water Enterprise), organization structures with corresponding manpower requirements (in numbers and qualities), detailed task descriptions, training materials, as well as the necessary logistic, organizational and institutional arrangements.

Typical EPD activities would take to the following order :

I. OBEJECTIVES

1. Prototype analysis based on the internal/external matrix;
2. Defining desired performance levels/performance indicators;
3. Defining enterprise performance/manuals, instruction sheets, management checklists.

II. PREPARATION

1. Starting up institutional/organizational arrangements;
2. Assessment;
3. Preparation of necessary documentation, manuals;

III. CONDITIONING

1. EPD Seminars
 - Objectives/timetable for a Development Program;
2. Plan of Operation.

IV. IMPLEMENTATION

9.

1. Systematic introduction of prepared materials/in-service training;
2. Troubleshooting.

V. MONITORING

1. Monitoring/evaluation of reports;
2. Call-back visits.

3.2. OBJECTIVES

3.2.1. General

Before embarking on an effort to introduce EPD, it is necessary to define what performance levels we want, how to measure these, and how to achieve these.

3.2.2. Prototype Analysis

Objective of the prototype analysis is to gain insight into the problems we are likely to encounter, and to start a process of policymaking with regard to Water Enterprises on a higher level. Prototype Analysis should therefore be done with officials of a higher level than the Water Enterprise, e.g. regional or national, but any person who can be considered well acquainted with the day-to-day practice, may be included.

Care should be taken that technical as well as non-technical views are sufficiently represented. The red line of this analysis again is the internal/external matrix. The exercise itself is concluded in the following manner² :

2. Para. 2.2.2. is the result of a prototype analysis.

1. Participants formulate individually on paper those problems they consider essential;
2. These essential problems are characterized by brief statements, put on cards, and grouped by participants into clusters of similar problems resulting in a "cluster-network";
3. Positioning of the problem clusters into a blank internal/external matrix, discussion of the problems and their relation, identifying means to solve the identified problems.

3.2.3. Performance Indicators

Based on the result of the prototype analysis, it is now time to define realistically our desired performance level and to describe that as unambiguously and precisely as possible. A practical means to do so is by using Performance Indicators. Annex II gives a number of guidelines to develop a relevant set of performance indicators.

An interesting example of an application of performance indicators is presented by the Local Water Utility Administration (LWUA), the Philippines (C.C. Leño, jr. and J.D. Knoll, jr., 1979). Here, sets of performance indicators were developed to trace training needs, but also to measure development which in turn determined additional funding. Annex III gives the two sets of "District Development Progress Indicators".

For EPD, performance indicators are grouped accordingly to the internal matrix. An application for Indonesian circumstances is given in fig. 7.

Figure 7. Internal Matrix

Performance Indicators

Stages Flows	1. Acquiring ↓	2. Adapting ◻	3. Processing ○	4. Disposing ↑
1. Finance	Collection Enforcement Comprehensive Rate Less than 10% in Arrears	Accounting System accord- ing to National Guidelines	Budgets met Break-even	Bills Paid on Time over 85%
2. Personnel		Personnel Rules and Regulations Employee Incentive Plan Systematic Training Balanced Staffing	Task Descriptions	
3. Equipment		Machinery Tested Meter maintenance Valve & Hydrant Exercise Mapping system Master Plan Equipment Stock Preventive Maintenance Scheme	Safety Program	
4. Materials		Material stock	Bacteriological Testing Drinking water standards	24 hours pressure 100% metering Illegal connections Unaccounted for water
5. Energy				
6. Information		Organization chart Records & Data Continuing Property Records.	Production Data	Public Information Reports submitted on time



3.2.4. Performance Definition

Having defined the yardsticks by which to measure the performance of a Water Enterprise, attention should be paid now to how a Water Enterprise should actually perform.

Commonly, the next step is the development of a formal organization which comprises :

- allocation of tasks and responsibilities;
- organization structure;
- technical and administrative procedures.

It should be noted that Water Enterprises do not operate in a vacuum and that in most cases a consensus already exists on how a Water Enterprise should be organized. Technology also points in a certain direction. Discretion should therefore be exercised in deciding upon an organization structure; important here is standardization which should start with organization structures, to facilitate the exchange of materials and experiences.

Having allocated tasks and responsibilities and defined technical and administrative procedures, it is time to define sufficiently detailed the tasks and responsibilities. In accordance with the conclusions of para 2.2.2., we concentrate on task descriptions.

Each task has a knowledge - and a skill dimension which require a different form of documentation (refer to fig. 8).

Type Task Knowledge/ Skill Dimension	Managerial	Supervisory	Worker
Knowledge			
Skill			
Documentation	Checklists	Course Books	Operator Manuals

Fig. 8. SKILL VS. KNOWLEDGE

To facilitate the process of task descriptions, instruction sheets are introduced which describe systematically and detailed the basic tasks, and which form the elements which can be recombined into operator manuals and course books of all sorts³. Instruction sheets can also easily be expanded into training manuals, should the need arise so⁴.

Instruction sheets follow a rigid format of 2 columns where the first column defines the task step by step, where as the second column deals with the keypoints. Keypoints contain that extra bit of information which makes the difference between succesful execution or failure. Annex V gives criteria for keypoints. It follows that good practical instruction sheets are best written by experienced supervisors. (or operators).

3. Annex IV gives an example of a portefolio of technical instruction sheets.
4. An interesting example of this approach is seen with the Caribbean Basin Water Management Project of the PAHO/WHO, which based on instruction sheets, has produced a wide range of training manuals.

3.3. PREPARATION

3.3.1. Institutional/Organizational Arrangements

One thing which cannot be stressed enough, is that sound institutional and organizational arrangements are a condition for successful implementation of EPD.

A good start would be the creation of a Control Group, composed of officials with sufficient authority to decide on means to overcome constraints the EPD eventually will face. To aid the Control Group in its decision making process, it is useful to develop checklists which will objectively indicate the progress made and whether to proceed or not to the next stage.

Matters to decide upon are a.o.

- budgets;
- training resources i.e. instructors, training materials, etc.;
- condition of the Water Enterprise :
 - . status
 - . management present;
- logistics.

In the Indonesian case, the Control Group was chaired by the Head of the Sub-Directorate of Development of the Directorate of Sanitary Engineering of Cipta Karya and was composed further of officials of the Directorate and the provincial project.

Annex VI gives the checklist used by this Control Group.

3.3.2. Assessment

Assessment means the first acquaintance with the Water Enterprise and its Management. Objective of the assessment is to

get a clear insight in the present state of the Water Enterprise, technical, administrative as well as organizational, its personnel, its training needs, the developments which are most likely to occur and potential of the Water Enterprise. It is wise to apply also in this case a checklist, which again is modelled after the internal/external matrix.

3.3.3. Preparation of necessary documentation

Based on the results of the assessment, necessary documentation for sound operations are developed. Documentation must include a concept accounting system and a concept technical Plan of Operation. Supporting materials in the form of manuals are compiled of instruction sheets. Attention should also be paid to the Information System.

3.4. CONDITIONING

3.4.1. General

The conditioning stage is the most critical stage of EPD and it is here where "art" is involved. Objective of this stage is to let the Management take its rightful position and assume full responsibility for EPD. Management is taken through a process of learning to appreciate the present situation of the Water Enterprise, stating objectives of the EPD, and drawing up a Development Program to achieve the stated Objectives.

3.4.2. EPD Seminar

The conditioning takes place in a seminar. Participants will be the Management and the heads of the difference sections while we try to limit the total number to about 10 persons.

Chairman should be the General Manager while a secretary is selected from the participants.

The seminar starts off, after the official opening, with a briefing on the objectives of the seminar, e.g. the formulation of a realistic Development Program.

Having obtained a clear understanding on this, the seminar proceeds with a analysis similar as described in para 3.2.2.⁵.

This exercise should generate a clear consensus on the problems of the Water Enterprise and methods to overcome these problems. Now the team should become more specific and formulate desired performance levels for the longer term (5 years) and short term (1 year) in terms of performance indicators as precisely as possible.

This is a rather straightforward exercise though the identification of operational performance indicators might take time.

The short term objectives should then be translated in a Development Program, setting these objectives, indicating what steps will be taken to achieve these objectives, assigning responsibilities for this steps, and indicating a timetable.

-
5. This exercise is therefore so useful as it learns the participants that there is a relationship between their problems in their particular department and the problems of their colleagues and that a joint effort to solve these problems is more efficient and in a number of cases the only way.

The Development Program must be realistic, taking into account the available resources in terms of information, manpower, installations, and budgets. A significant input here will be delivered by the Consultant who has already prepared the necessary documentation etc. This should be revalidated in view of the stated objectives.

This might mean that in a number of cases, the objectives will need to be reformulated. As a final check, the team should verify the soundness of their objectives against the following criteria⁶ :

- are the objectives significant and challenging enough;
- are the objectives realistic and feasible enough to be achieved;
- is there a high enough level of commitment to the objectives.

3.4.3. Plan of Operation

Consistent with the objectives of the Development Program, a technical Plan of Operation should be drawn up by the Management, assisted by the designer, responsible authorities, the Consultant, whenever required. The Plan of Operation should be as specific as possible stating shifts etc., but also clear instructions on the use of the various installations.

6. Based upon R. Abramson and W. Halset, 1979, p.35.

3.5. IMPLEMENTATION

3.5.1. General

Having established a Development Program with its objectives and timetable, certain conditions still need to be fulfilled prior to the implementation of said Development Program.

In general, these conditions bear relation to logistic and organizational matters and concern a.o.

- formal decisions on
 - * Development Program
 - * Plan of Operation
 - * Organization structure
 - * Accounting system
- key staff available
- installations operational
- logistics e.g. the availability of forms.

These items should be reviewed by the Control Group which decides whether to proceed to the implementation stage.

Activities during the implementation stage may be subdivided in the following 3 types :

- counseling;
- training;
- troubleshooting.

The purpose of counseling is clear; the Management needs the opportunity to discuss policy matters with outside persons, especially during a transition stage. It is also needed to follow the progress of the Development Program. Counseling may range widely in subject but must aim at supporting the Management at all times.



EPD explicitly chooses for in-service training. Before continuing on the methods of implementation, it is wise to elaborate on the limitations of this choice. As stated before, each task has a knowledge and skill dimension. A proper designed in-service training program should aim to accommodate also the needs for knowledge. In a number of cases, however, this is not feasible. Tasks with a high knowledge dimension can be learned (partly) more economical outside; this goes especially for knowledge learned at educational institutes i.e. accounting, (electro-) mechanical engineering. In-service training will provide then the finishing touch, providing the specific skills for the tasks. It should be also noted, that many skill training programs err because they overstress knowledge (V.A. Miller, 1979). Managerial and Supervisory staff form a special case. Their need for knowledge is high but might be accommodated by counseling and lectures. As a last resort, participation in an outside course should be considered. Care should be taken that the needs of the trainee match the objectives of that course.

The next component of the implementation stage is troubleshooting, identifying troubles and solving them. It is much easier, prior to embarking on the Development Program, to have a sound base for departure. Though catering for all sorts of problems, the emphasis is on technical matters. Obviously, as in general Water Enterprises are weakest here and because training cannot be given as long as the installations do not function. Most of the troubles should already have been identified during the EPD Seminar.



3.5.2. In-service training

In-service training is that top of the iceberg where all the preparations become visible. Good preparation is the key to success. To recapitulate, preparation should be made for the following matters :

- * materials - with EPD, instruction sheets, course books and management checklists. These materials should be comprehensible, comprehensive and skill oriented, supplying knowledge when it is directly relevant.
- * trainers - if not available, developed during the preparation stage. Obviously, more detailed materials will lower the requirements for a trainer.
- * trainees - inventory of training needs available (identified during assessment)
- * logistic - obviously we need the trainees, the trainers and the materials at the designated time and place, training facilities in the form of classroom etc., writing materials etc.

In the concept of EPD, in-service training is a straight forward exercise. Depending on the level of the trainee, the prepared documentation will be introduced in the following manner :

Managerial	seminars, counseling
Supervisory	seminars, lectures
Workers	lectures, on-the-job training

Higher echelons should be encouraged to follow the training sessions of the lower echelons; they can do so easily without revealing eventual shortcomings in their knowledge.

Especially for the workers, the training sessions should be as practical and task-directed as possible.

In practice this means that during the lectures, the instruction sheets will be explained and discussed, and directly practiced in the on-the-job training.

3.6. MONITORING

3.6.1. General

EPD is a development process which must be sustained.

Essential is regular evaluation and feed-back.

Progress must be evaluated against the objectives stated in the Development Program, i.e. the performance indicators. As the Management is responsible for the implementation of the Development Program, it is also the Management which must evaluate.

Eventually this should lead to an annual up-dating of performance indicators, objectives and Development Program. Evaluation should be monitored by the Control Group.

3.6.2. Monitoring

It might still be necessary to monitor the progress of the Development Program after the training sessions have been finished and the Consultants have left the Water Enterprise. A practical means is the evaluation of the technical and financial reports. These will be studied, commented if necessary and fed back to the Water Enterprise. The evaluation



of the Water Enterprise itself might also be a source of information.

3.6.3. Call-back visits

Call-back visits are scheduled to prevent falling back of standards attained during the training sessions. Objectives of the call-back visits are redressing short comings and/or introducing new materials. Call-back visits may be scheduled in the Development Program, may be in answer to a request from the Water Enterprise or result from the results of the monitoring.

4. R E V I E W

22.

In the preceeding chapters, a methodology for Organization Development in Water Enterprises operating urban water schemes in developing countries has been introduced. The mechanism Enterprise Performance Development (EPD), has been illustrated by means of a case description in Indonesia.

As the name EPD points out, EPD is centered on the performance of the enterprise. Much of the effort is directed at introducing the skills (and complementary knowledge) necessary for sound operations, both technical and administrative. To enhance the impact of EPD, documentation is amply provided in the form of instruction sheets, operator manuals and management checklists. It is felt that by developing sound operations, and troubleshooting fits within this scope, much of the attention of the Management previously taken up by routine technical matters, can be focussed now on matters of policy.

A strong advantage of EPD is that it employs a mechanism by which the Management is put into its proper position and by which it has to take the lead. On the way, it introduces a number of "tools of management" which no doubt will benefit the Water Enterprise. Next it observes one golden rule many Development Programs have learned the hard way : active support of the Management is essential for success.

A disadvantage of the methodology is that it takes much time and effort to realize the necessary preparations.

Until now, we have not come across means to overcome this disadvantage. One method to reduce this disadvantage is standardization, in documentation (instruction sheets), as well as in the organizational format to promote exchange of experiences and materials.

23.

The question whether EPD should be introduced, has not been dealt with. It has been considered to be outside of the scope of this paper although of course it is a very valuable question⁷.

However, it is felt that every organization would benefit from a methodology of systematically setting of objectives, devising means to achieve them, and monitor and evaluate the progress made.

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7. The interested reader is referred to R. Abramson and W. Halset, Planning for Improved Performance, International Labour Office, Geneva, 1979, p.13 - 14.

B I B L I O G R A P H Y

R. Abramson and W. Halset, Planning for Improved Enterprise Performance, International Labour Office, Geneva, 1979 (A practical valid introduction to Organization Development).

E.J. de Bruyn and B. van Bronckhorst, Systematic judgement in Production System Development, N.V. Uitgeverij Smit van 1876, Hengelo, the Netherlands, 1980 (deals with analyses of organizations, i.e. the internal/external matrix).

N. Carefoot, Manpower Development, The key to Water Resources Development (paper presented at the Regional Seminar on Water Resources Assessment Development and Management in Small Oceanic Islands of the Caribbean and the West Atlantic, Bridgetown, Barbados, Oct. 1980).

C.C. Leño, jr, and J.D. Knoll, jr, Human Resource Development, the LWUA (Philippines) Experience (paper presented to the International Regional Conference on Water Supply, Singapore, 14 February 1979)

(An interesting use of Performance Indicators).

V.A. Miller, The Guidebook for International Trainers in Business and Industry, Van Nostrand Reinhold Company, New York, 1979 (A rather complete inventory of training and development systems, methods and techniques).

TERMS OF REFERENCE NATIONAL MANPOWER DEVELOPMENT PROGRAM, INDONESIA

Terms of Reference for consultants team

There are four items to consider:

- . Manpower Classification System
- . Management Training Guidelines
- . Technical Operations Training
- . Management of MDP

Manpower Classification System

- produce a comprehensive catalogue of jobs in water supply sector to form the basis of the classification system;
- develop a system for collecting, collating and feeding data on project activities and existing water enterprise manning levels into the system;
- synthesise the data to produce forecasts of manpower requirements in terms of where, when, how many and in which job category, for new projects and existing water enterprises;
- identify key staff and organisations/departments involved in the operation of the system and train them for its implementation;
- assist in the implementation of the system and monitor early progress;
- suggest modifications deemed necessary to streamline the operation after monitoring.

Management Training Guidelines

- from data available identify the training needs in respect of general management skills required in water enterprises (WE's) in order to meet WE/PDAM* objectives;
- produce guidelines on the methods and techniques to be used to carry out the training including recommendations on planned experience.

Technical Operations Training

- provide assistance in carrying out detailed analysis of training needs;
- carry out detailed analysis of training needs for individual jobs in the technical function as identified in the Manpower Classification System;
- produce training recommendations for these jobs;

* Perusahaan Daerah Air Minum, Indonesian for Self Sustaining Organisation

- carry out the design of a modular training system in accordance with the training recommendations;
- produce training manuals and supporting material for use in the operation of the modular training system including pre- and post-course testing;
- identify the need for purpose built training centres/facilities;
- assist in the initial implementation and monitoring of the training;
- the training of counterpart staff.

Management of the Manpower Development Programme

Provide assistance in:

- the development and operation of the Manpower Classification System;
- forecasting national manpower requirements in the various categories of the Classification System and with the co-operation of the Regional Manpower Development Officers (RMDO's), provincial manpower requirements, both project related and for existing WE's;
- liaising with the Ministry of Internal Affairs on the recruitment of manpower to meet the forecast manpower requirements;
- the identification of training needs and the production of training recommendations for the jobs within the Classification Systems including training manuals, lists of equipment and materials and visual aids/handouts;
- carrying out on a national basis off-the-job training in general management, some aspects of technical management and specialised pieces of training for which there is low demand and which could not be provided on a regional basis;
- recruit, train and co-ordinate the work of the RMDO's including providing assistance where required in the early stages of their work;
- development of new training programmes and supporting material as required;
- budgeting and financial control of the Manpower Development Programme;
- maintaining close contacts with the Education and Training Departments of other Ministries, government agencies and manufacturing and service industries within Indonesia.

Guidelines for the Development of a relevant set of Performance Indicators.

- (1). think of what you consider the most important performance indicators relevant to organizational objectives in the key areas of your work;
- (2). describe briefly the nature of these indicators, be as specific as possible; try to obtain general group agreement on each item;
- (3). in each case classify the type of indicator being described, whether production or service, productivity, financial or other;
- (4). ascertain which indicators are readily measurable and which are not;
- (5). find out for which indicators is information already available and from what source;
- (6). determine for which indicators must additional data be generated (this might require the development of a new management information system);
- (7). check the inter-relationships of your indicators, their conflicts, parallel movement, mutual reinforcement, overlapping or duplication;
- (8). check any dominating or dominated indicators;
- (9). ascertain which indicators are more consistent with the optimisation of organizational performance, and which are likely to lead to sub-optimisation;
- (10). check consistency with and responsiveness to major organization objectives and goals.

- (11). apply any other checks or tests you think might be helpful in analysing the indicators;
- (12). rank your list of performance indicators in priority order in terms of their importance; in this connection, you can point out that in many organizations one particular performance indicator may be without question the most dominant and important because it is the basic measure by which over-all organizational performance can be judged; examples of such key performance indicators follow;
- number of net exchange telephone connections per annum (a telecommunications organization);
 - number of gallons of water supplied per month (a water board);
 - per cent of monthly on-time departures (an airline);
 - tons of cargo handled per gang shift (a port);
- (13). before you move on, ensure that your management team has secured group consensus on the inclusion of each short-time objective and its performance indicators as well as on the total package of performance indicators.

Source : R. Abramson and W. Halset, Planning for Improved Enterprise Performance, International Labour Office, Geneva, 1979.

EXAMPLE USE PERFORMANCE INDICATORS

DISTRICT DEVELOPMENT PROGRESS INDICATORS

Phase I Indicators

Utility Rules and Regulations
Billing and Collecting System
Ageing of Accounts
Collection Enforcement
Personnel Rules and Regulations
Organization Chart
Job Descriptions
Commercial Chief
Finance Officer
Administrative Chief
Production Chief
Construction and Maintenance Chief
General Accounting Systems
Chart of Accounts
Budget
Public Information
100% Metering
Bacteriological Testing
Chlorine Residual
Production Data
Machinery Tested
Customer Service System
10 Year Cash Flow Projection
Rate Strategy
Comprehensive Rate
Less Than 10% in Arrears
Bills Paid on Time Over 85%
Reports Submitted

Phase II Indicators

Illegal Connections
Unaccounted for Water

Economics
Materials Stock
Tools and Equipment
Meter Maintenance
Production Machinery
Equipment Maintenance
Valve and Hydrant Exercise
Mapping System
System Operation
System Maintenance
System Correction
System Pressure
Master Plan
24 Hour Pressure
Drinking Water Standards
Subdivision Policy
Safety Program
Training
System Growth
Dead Ends
Crew Efficiency
Standard Procedures
Record and Data
Continuing Property Records
Employee Incentive Plan
Balanced Staffing

Sources : Carlos C. Leano, jr, and J.D. Knoll, jr, HUMAN RESOURCE DEVELOPMENT, THE LWUA (PHILIPPINES) EXPERIENCE.
(paper presented to the International Regional Conference on Water Supply, Singapore, 14 February 1979).

PORTEFOLIO TECHNICAL INSTRUCTION SHEETS

CODE	DESCRIPTION	
000	<u>PRODUCTION</u>	
010	EXPLORATION	
011	<u>Intake</u>	
011/..	General	operations maintenance recordkeeping
---	Intake pumps	refer to <u>pumps</u> (310)
012	<u>Deep Well</u>	
012/..	General	operations maintenance recordkeeping
---	Deep well pumps	refer to <u>pumps</u> (310)
013	<u>Spring Captation</u>	
013/..	General	operation maintenance recordkeeping
040	WATER TREATMENT	
040/..	<u>General</u>	operations fault chart recordkeeping
041/..	<u>Flash Mix</u>	
041/..	General	operations maintenance
---	Stirrer	refer to <u>stirrer</u> (341)
042	<u>Flocculation</u>	
042/..	General	operations maintenance
043	<u>Sedimentation</u>	
043/..	General	operation maintenance
---	Drain pumps	refer to <u>pumps</u> (310)
044	<u>Filters</u>	
044/..	General	operations maintenance
---	Backwash pumps	refer to <u>pumps</u> (310)

CODE	DESCRIPTION	
050	CLEAR WATER STORAGE	
050/..	<u>General</u>	operations maintenance
100	<u>DISTRIBUTION</u>	
130	MAIN LINES	
130/..		laying (PVC and AC) flushing repairs
140	SERVICE CONNECTIONS	
140/..		reconnaissance design costing laying repairs recordkeeping
160	REVISION DRAWINGS	
160/..		preparation basic maps new works revisions
200	<u>POWER SUPPLY SYSTEMS</u>	
210	POWER SUPPLY	
211	<u>Gensets</u>	
211/..	General	operations recordkeeping additional to manufacturers instructions
300	<u>MECHANICAL SYSTEMS</u>	
310	PUMPS	
310/..	<u>General</u>	principles fault chart
311	<u>Centrifugal Pumps</u>	
311/..		operations maintenance
312/..	<u>Intake Pumps</u>	
312/..		operations maintenance

CODE	DESCRIPTION	
313	<u>Deep Well Pumps</u>	
313/..		operations maintenance
314	<u>Dosing Pumps</u>	
314/..		operations maintenance
320	VALVES	
321	<u>Gate Valves</u>	
321/..		installation maintenance repairs
322	<u>Non-return Valves</u>	
322/..		installation maintenance repairs
323	<u>Air release Valves</u>	
323/..		installation maintenance repairs
330	FITTINGS	
331/	<u>Fire Hydrants</u>	
331/..		installation maintenance repairs
332	<u>Wash Outs</u>	
332/..		installation maintenance repairs
340	STIRRERS AND MIXERS	
341	<u>Stirrers</u>	
341/..		operations maintenance
400	<u>DOSING</u>	
410	CHEMICALS	
411	<u>Chemicals handling</u>	
411/..		lime aluminium sulphate kapuri

CODE	DESCRIPTION	
412	<u>Chemicals Safety</u>	
420	DOSING SYSTEMS	
421	<u>Line saturator</u>	
421/..		preparation solution operations. maintenance
422	<u>Chlorination</u>	
422/..		preparation solution (kapurit) operations maintenance
423	<u>Aluminium sulphate dosing</u>	
423/..		preparation solution operations maintenance
500	<u>MEASURING DEVICES</u>	
520	WATER QUANTITY GAUGES	
521/..	<u>Water meters</u>	maintenance small repairs calibration
600	LABORATORY	
601	<u>Standard Tests</u>	
601/..		turbidity / color pH calcium bicarbonate jartest ammonium residual chlorine mangnese total iron chloride sampling information routing recordkeeping

CODE DESCRIPTION

602 Dosing Calculations

602/..

.lime

aluminium sulphate

kapurit

Tips on deciding key points

The way to decide key points is to identify anything in each learning stage that may cause difficulty. Pay particular attention to:

- | | |
|----------------------|---|
| Safety | Is there any safety risk to the learner, or others, in this stage? |
| Skill | Does it need skill to perform this stage? It may require skilled movement, balance, timing, positioning, sudden effort and control. |
| Use of senses | Does this stage call for the critical use of a sense (more acute than in normal everyday life). This may be a sense of sight, hearing, feel, smell or taste. |
| Guidelines | Can you provide clear guidelines or measurements for performing the stage (e.g. cut <i>5mm</i> above bud; turn lever downwards $\frac{1}{4}$ turn)? |
| Mental step | Is part of this stage done 'in the head' – a decision or a mental calculation perhaps? You will need to draw this to the learner's attention, since he won't see it happening when you demonstrate. |
| Common errors | Do learners, or even experienced workers, tend to make errors or forget something in this stage? |

Remember, only identify key points that are *vital* to learning or safety.

The fewer key points you put across the better.



If you include too many key points they will lose their impact.

O&M IMPLEMENTATION CHECKLIST

OBJECTIVE : This checklist shall determine objectively when Consultants may proceed to the next stage of O&M implementation.

I. Institutionalization

1. Formal decision (S.K) on status Water Enterprise (BPAM/ PDAM) .
2. Formally nominated management (S.K) and present



ASSESSMENT

(refer to assesment checklist)



II. Preparation for EPD (Enterprise Performance Development)

1. Formal decision on Organization Structure
2. Formal decision on the Buku Pedoman to be used
3. Forms prescribed in the Buku Pedoman, produced
4. Key staff (Tenaga Inti) available
5. System operational (test trials)



EPD