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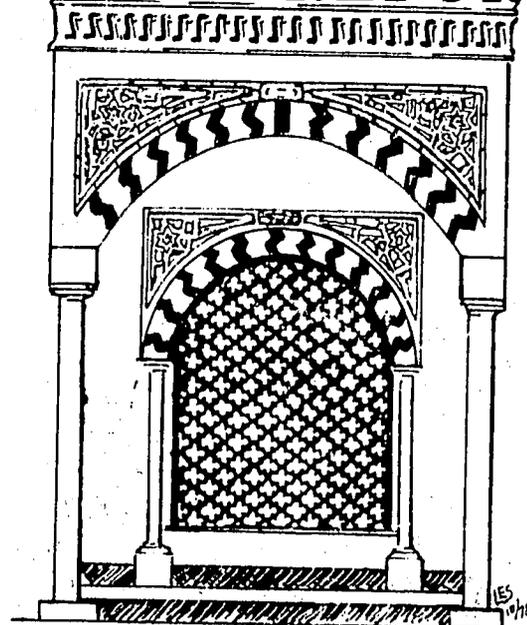
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ARAB REPUBLIC OF EGYPT  
MINISTRY OF DEVELOPMENT  
AND NEW COMMUNITIES

MANAGEMENT AND TARIFF STUDIES  
RELATIVE TO WATER/SEWERAGE SYSTEMS

MANAGEMENT SYSTEMS  
MANAGEMENT INFORMATION  
SYSTEMS  
FINAL REPORT



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
وجعلنا من الماء كل شيء حي  
صدق الله العظيم

BVI-ATK ASSOCIATES WITH SABBOUR ASSOCIATES

BLACK & VEATCH  
INTERNATIONAL  
CONSULTING ENGINEERS

A.T. KEARNEY, INC.  
MANAGEMENT CONSULTANTS

SABBOUR ASSOCIATES  
CONSULTING ENGINEERS

# MANAGEMENT SYSTEMS

# MANAGEMENT INFORMATION SYSTEMS

## FINAL REPORT

### The Story of Our Cover:-

On our cover is a sketch of a sybil, which is a fountain. During the Ottoman Empire these were a common source of drinking water. A well is located at ground level and a balcony on the second level where children were taught the Koran. Usually located near mosques, sybils were built and then donated to the public by various benefactors.

Beneath the sketch is a quote from the Koran, "We made from water all living things".



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CONSULTING ENGINEERS**

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CONSULTING ENGINEERS**

بلاك أند فيتش العالمية

استشارات هندسية

أ. ت. كاري

استشارات إدارية

المكتب الهندسي الاستشاري « صبور »

استشارات هندسية

OUR REF: 79-243  
YR REF:  
DATE: October 8, 1979

Engineer Soliman Abd El Hai  
Chairman  
Advisory Committee for Reconstruction  
Ministry of Development and New Communities  
1 Ismail Abaza Street  
Cairo, A.R.E.

Dear Engineer Abd El Hai:

Pursuant to the provisions of Paragraph 6.5 of Appendix 1 to the Contract dated April 6, 1978 between the Ministry of Housing and Reconstruction and BVI-ATK Associates for Management and Tariff Studies Relative to Water and Sewerage Systems, we are pleased to submit the Final Report on Management Systems - Management Information Systems. It is responsive to the provisions of Paragraph 5.3.7 of Appendix 1 to the Contract and incorporates, as appropriate, material related to the review comment on the Interim and Draft Final Reports.

Your attention is directed to Section 0.0 of this report, Executive Summary, where a brief synopsis of the findings and recommendations may be found.

We wish to acknowledge the assistance and cooperation of the many individuals, agencies and organizations contacted during the course of the study.

We appreciate the opportunity to serve the Ministry on this important assignment.

Very truly yours

BVI-ATK ASSOCIATES

*John R. Scott*  
John R. Scott  
Project Director

cc: USAID  
TAMS  
Mr. A. F. Naguib

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- 3 Budgeting Process
- 4 Long-Range Financial Planning
- 5 GOSSD and SCA Financial Statements
- 6 Description of Accounting Books
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- 8 Report Descriptions

Note: Exhibits are located at the end of the section in which they are referenced. Appendices are located at the end of the report.

## GLOSSARY

Responsibility Center: A responsibility center is an organizational unit within a firm that is subject to the direction of an individual who has been assigned the responsibility and has been delegated the authority to accomplish an objective(s).

Primary Responsibility Center: The lowest level of responsibility center.

Summary Responsibility Center: A responsibility center comprised of one or more primary responsibility centers.

Expense: The value of a resource consumed by an organization.

Expenditure: Cash disbursement to acquire a resource. The resource may be stored or used in a capital project rather than expensed.

## ABBREVIATIONS

AWGA	Alexandria Water General Authority
GOGCWS	General Organization for Greater Cairo Water Supply
GOSSD	General Organization for Sewerage and Sanitary Drainage
SCA	Suez Canal Authority
SAS	Standardized Accounting System

## O.O BACKGROUND AND EXECUTIVE SUMMARY

This Report presents the findings, conclusions and recommendations of BVI-ATK Associates concerning Management Information Systems in the major water and sewerage utilities of Egypt. The work was performed under a contract dated April 6, 1978, with the Ministry of Housing and Reconstruction. It fulfills Task 5.3.7 in the Scope of Work of Appendix 1 to the Contract.

### O.1 GENERAL BACKGROUND

This Report is one of a series of reports. Each recommends improvements in the management practices and tariff structures of the utilities.

The organizations studied were:

- Alexandria Water General Authority (AWGA).
- General Organization for Greater Cairo Water Supply (GOGCWS).
- General Organization for Sewerage and Sanitary Drainage (GOSSD).
- Suez Canal Authority water departments (SCA).
- Sewage operations of the following governorates:
  - . Suez
  - . Ismailia
  - . Port Said

The purpose of these reports is to enable the organizations to plan, control and finance their activities more effectively. This Report focuses on planning, budgeting, control and communication of information among managers.

Steps have been taken to ensure that the recommendations presented here are practical and beneficial. Some of these steps were:

- Reports of other consultants to the utilities were studied.
- Members of top management, general managers and many middle and lower level managers were interviewed in each major organization.
- Numerous internal documents and reports were examined.
- Relevant literature and government documents were reviewed.

## 0.2 OBJECTIVES

The outputs of this study, as summarized from the Scope of Work, include:

- A review and analysis of the existing management information systems.
- The design of simple and flexible management information systems including:
  - . An improved budgeting system.
  - . An improved accounting system.
  - . A data collection system that will supply data for:
    - Capital budgeting.
    - Operations budgeting.
    - Financial and cost control.
    - Operations control and evaluation.
  - . Reports that permit systematic monitoring of financial and non-financial performance compared to plans.
- The design of an information system for top-level management.
- Recommendations for improvements that can be made in the existing systems before the recommendations of the Organizational Environment and Structure Study are implemented.

### 0.3 PERSPECTIVE

Good information systems help managers plan and control the performance of an organization. These systems should:

- Provide information for planning.
- Communicate the goals and plans of the organization.
- Promote coordination of efforts among managers.
- Assist evaluation of the performance of the organization and its managers.

Information systems can only provide information. If managers do not plan, make good decisions or take corrective action when results do not meet the plan, then even excellent information systems will provide few benefits to the organization.

Information comes in many forms:

- Written reports that are prepared on a regular basis
- Verbal discussions and reports
- Log books and forms
- Irregular written reports

This Study considers the regular reports that enable managers to plan and control the work.

In general, verbal discussions, log books and forms provide the data required to do the work. Management may occasionally require one-time or irregular reports to meet unusual planning or control needs. These types of information, though reviewed when appropriate, are not the subject of this Study.

Throughout this Report, a distinction will be made between data and information. Data are numbers or words that must be rearranged, analyzed or abstracted before they become useful to the decision maker. Information is data that has been analyzed and arranged so that it is directly useful to the decision maker.

#### 0.4 EXECUTIVE SUMMARY

This Paragraph summarizes the findings, conclusions and recommendations of the Study. This summary follows the same order as the remainder of the Report.

##### 0.4.1 Budgeting

The principal objective of the present budgeting process is to obtain funds from the central government. The existing budget cannot be used for control because the:

- Allocation of expenditures is not decided.
- Timing of expenses is not estimated.
- Basis of need for expenses is not presented.

The proposed budget system requires:

- Establishment of responsibility centers so that responsibility for financial and operational control is clearly assigned.
- An operating budget that is divided into months for each Responsibility Center.
- Budget requests based on explicit analyses of need rather than on last year's budget, the anticipated increase in production plus inflation.

#### 0.4.2 Capital Programming

Until recently, only small amounts of capital were available to the utilities. Now that capital has become more available, foreign consultants have been engaged at each of the major utilities to prepare master plans for water and sewerage facilities.

Capital programming should be improved at each utility.

- Needs of customers have not been met. The primary reason has been lack of funds, but lack of long-range planning has also been a factor.
- Acquisition and allocation of funds should be better planned. None of the utilities has a well-defined process for planning its capital program. Budgeting is hampered by lack of guidelines, poor justification of projects and inappropriate time frames set by the State.
- Control mechanisms need strengthening. Projects have not been designed to simplify the control task. Progress reporting depends on the judgement of engineers rather than on an analysis of measurable results.

Recommendations include:

- Developing a long-range plan that is updated and approved annually by the Board of Directors.
- Preparing an annual capital (not just project) budget.
- Analyzing in detail the tasks for each major project. The analysis should permit accurate assessment of progress and costs incurred at regular intervals during the project.
- Following and forecasting project progress and costs and departmental performance through regular reports.

### 0.4.3 Accounting Systems

The existing systems meet external reporting requirements but they do not provide useful internal cost and productivity information. The accounting system requires careful checking for mathematical accuracy and signatures on transactions.

More important questions such as the following are not answered:

- Is the appropriate amount being expended?
- Are assets well controlled?
- Is the right planning information available?

Because of the many defects and inefficiencies of the present systems, completely new accounting systems should be developed. These systems would:

- Place greater responsibility for controlling costs on operations managers and supervisors.
- Provide data for evaluation of departmental performance.
- Streamline accounting procedures.
- Improve control of assets.
- Permit the gradual introduction of electronic data processing.

### 0.4.4 Information for Planning and Control

The existing information systems have serious deficiencies. They do not:

- Provide enough information for planning.
- Communicate goals and plans of the organization.
- Encourage efficient use of resources.
- Provide information on a timely basis.
- Focus attention on important decisions managers must make.

A comprehensive set of management reports is recommended for each of the major operating and staff departments. These reports include both financial and operating information. Summary reports of performance against plan should be circulated to top management. A complete description of each report (purpose, format, preparer, receivers, sources, frequency and timing) is included.

## 1.0 BUDGETING

### 1.1 PURPOSE OF BUDGETS

Budgets help organizations:

- Determine needs.
- Acquire funds.
- Allocate resources.
- Control the use of resources.

Each of the utilities prepares an annual budget through which it acquires funds from the State. They make only limited use of budgets for internal planning and control.

The annual budgets of the utilities are divided into two components - the operating budget and the capital budget. The operating budget is concerned with the day-to-day operations of the utility. It includes provisions for revenues from the sale of water and services, and costs of production, distribution, sales and administration. The capital budget contains provisions for the construction of plant and equipment and for funds to support increased accounts receivable, inventories and assets.

The operating and capital budgets should be related through a Sources and Uses of Funds Statement. It shows where funds are generated whether from operations, use of existing assets, loans or contributions of capital, and where they are spent whether for operations, construction or increase of current assets.

This Section is concerned primarily with the operating budget. The capital budget and sources and uses of funds statement will be discussed in greater detail in Section 2.0.

## 1.2 FINDINGS AND CONCLUSIONS

### 1.2.1 Needs

Needs are not properly defined. When managers were asked how budgets are determined, they commonly replied that the budget figure is based upon the current budget, the estimated increase in water (or sewerage) production and an estimated inflation factor. A review of budget requests to the State indicates that:

- Personnel costs are estimated by calculating the cost of present staff plus requested new personnel. Many mathematical calculations and official decisions are shown, but no analysis of how many people are needed to perform the work is provided.
- Material costs are justified by reference to increased production. The increased production is not justified and production conditions are implicitly assumed to be constant.
- Maintenance costs (both parts and labor) are poorly defined and are not justified by substantial analysis.
- Services are listed but not justified. Provision of the service by utility personnel versus outside purchase is not discussed.
- Interest and depreciation appear to be appropriately analyzed.

The lack of analysis is indicated by:

- Large variations between budgeted and actual expenses. (See Exhibit 1.1)
- Substantial adjustments during the budget year. (See Exhibit 1.2)
- Substantial changes (and deterioration) in the ratio of people to water produced or sewage collected. (See Exhibit 1.3)

The implications of this lack of analysis are:

- Excessive expenses may be incurred.
- Vital functions may not be adequately performed.

#### 1.2.2 Acquisition of Funds

Acquisition of funds is poorly planned. The findings and conclusions presented here relate to both the operating and capital budgets. Recommendations will therefore be made both in Paragraphs 1.3 and 2.3.

1.2.2.1 Long-range financial planning is not done. The utilities are assembling long-term capital spending plans but they have not prepared long-term financial plans. Acquisition of funds is planned primarily for the current year. As a consequence:

- Decision makers are unable to evaluate the impact of large capital programs on the utilities' future financial structure and revenue requirements.
- Commitments can be made only for the current year on multi-year programs.
- Future rate needs have not been planned.
- Reserves have not been funded.

1.2.2.2 Sources and uses of funds have not been clearly identified. Management does not get a comprehensive view of the sources and uses of funds. They are presently spread through all parts of the State budget. As a consequence:

- Some sources are overlooked. (See Paragraph 1.2.2.3.)
- Expenses and expenditures are often equated whereas good management might suggest an increase or decrease in certain assets regardless of the trend in expenses. (See Appendix I, Differentiation of Expenses and Expenditures.)
- Little attention is given to non-cash sources of funds.

Cash flows are not routinely projected so the available funds are sometimes insufficient. GOGCWS and GOSSD, for example, recently experienced several days without funds.

1.2.2.3 Closer control of assets would reduce the need for funds. Large amounts of funds have been required to finance accounts receivable at GOGCWS and AWGA in recent years:

TABLE 1.1

ACCOUNTS RECEIVABLE

<u>Value on December 31</u>	<u>GOGCWS (LE 000's)</u>	<u>AWGA (LE 000's)</u>
1973	2,306	789
1974	3,021	820
1975	2,693	894
1976	3,015	1,153
1977	3,897	2,364
1978	3,836	2,691

Sources: Annual reports

An aggressive collection campaign might reverse the trend.  
(See the Procedures and Methods Report, Section 4.0, for further discussion of billing and collecting procedures.)

Closer control of inventories might also reduce the need for funds. Months of inventory on hand, shown in Table 1.2, is a measure of how well inventories are controlled:

TABLE 1.2  
MONTHS OF INVENTORY ON HAND (1) (2)  
DECEMBER 31, 1977

	<u>GOGCWS</u>	<u>AWGA</u>	<u>GOSSD</u>
Raw Materials	5.6	3.8	33.2 <sup>(3)</sup>
Fuels and Oils	4.1	2.5	3.1
Spare Parts	77.1	48.0	11.9

Notes: (1) Months on hand =  $\frac{\text{(Value of Inventory, Dec. 31, 1977)}}{\text{Budgeted use in 1978}}$  (12)

(2) Inventory detail was not available for SCA.

(3) This value represents the value of office supplies divided by the budgeted value of raw materials. The respective values were LE 14,309 and 5,160.

Sources: Annual reports.

Achievement of a lower target for spare parts on hand would free funds for other uses.

A considerable amount of scrap metal was observed during visits to plants. As shown in Table 1.3, scrap sales have been small in recent years:

TABLE 1.3  
SALE OF SCRAP<sup>(1)</sup> - LE

<u>Year</u>	<u>GOGCWS</u>	<u>AWGA</u>	<u>GOSSD</u>
1976	3,328	1,821	12,982
1977	11,085	1,646	12,717

Note: (1) Similar data were not available for SCA.

Sources: Annual reports.

A scrap identification and sales program might provide a small but helpful flow of cash to the utility.

The following factors contribute to the lack of control of assets:

- There is no system for tracking the presence, need for, or condition of assets.
- Responsibility for control of assets is not assigned.
- Management is not held responsible for the use and condition of assets.

1.2.2.4 Revenue estimates do not match actual results.

Revenues estimated in the original budget are frequently higher than actual billed revenues. (See Table 1.4.)

TABLE 1.4

BUDGETED VERSUS ACTUAL REVENUES<sup>(1)(2)</sup>

<u>Organization</u>	<u>Actual Revenues as a Percent of Original Budget</u>	
	<u>1976</u>	<u>1977</u>
AWGA <sup>(3)</sup>	88%	109%
GOGCWS <sup>(3)</sup>	86	71 <sup>(4)</sup>
GOSSD <sup>(5)</sup>	96	145

Notes: (1) Revenues from Production Item 1 in the budget.

(2) SCA data were not available.

(3) Water revenues only.

(4) Adjusted budget was within 3% of actual.

(5) GOSSD revenues are small and not easily predicted.

Sources: Annual reports.

These overestimates are compounded by the fact that a significant portion of revenues billed have not been collected. For planning, budget revenues are assumed to be cash received. These errors therefore greatly understate the utilities' needs for State support.

The following factors contribute to the large errors:

- No systematic analysis of water use by customer class by branch is made.
- Average billing rates used to calculate total revenue are not based on detailed analysis of the origin of demand.
- Management has no incentive to meet the budgeted revenue estimate. The State has provided the difference.

### 1.2.3 Allocation of Resources

Resources are sometimes poorly allocated. Four facts suggest that resources are sometimes poorly allocated:

- The budget does not show any allocations of budget items among departments. For example, the budget does not show the allocation of:
  - . People among departments.
  - . Maintenance costs between plants and networks.

Without such analyses, poor decisions will sometimes be made.

- Maintenance has not been given adequate priority as demonstrated by:
  - . Non-functioning equipment in the plants.
  - . Deteriorating buildings.
  - . Unsafe working conditions.

See the Organizational Environment and Structure Report for recommendations to improve consideration of maintenance through changes to the State budget process.

- Some projects are not completed due to lack of funds in later years.
- Alternative approaches to problems are not considered. For example, comprehensive programs for the following have not been tried:
  - . Water conservation
  - . Preventive maintenance

#### 1.2.4 Structure of Budgets

Budgets are not structured for control. When a manager knows what is expected of him, he is more likely to be alert for opportunities to meet the goal. Actual events, not just numbers on a report, will be controlled. The current budgeting system at the utilities provides neither cost goals for managers nor a framework for reporting costs:

- Departmental budgets do not exist.
- The budget is not divided into monthly or even quarterly estimates.
- Managers are not held responsible for costs of their departments.

The present budget systems are primarily useful for acquiring State funds.

### 1.3 RECOMMENDATIONS

The recommendations in the following Paragraphs should resolve the shortcomings in the process for developing the operations budget (Parts 1 and 2 in the current system). While the basic objective of the present budgeting system is the acquisition of State funds, the recommendations presented here are designed to improve internal control.

Because these recommendations are concerned with control, the focus is on estimating expenses rather than expenditures. Expenditures measure the amount of resources that are acquired and how much cash is disbursed. Expenses measure the amount of resources that are actually used. For example, an expenditure occurs when alum is purchased and stored in a warehouse. It does not become an expense until it is used in the plant.

The recommended operations budgeting system has the following features:

- Budgets are prepared by managers of responsibility centers and consolidated upward to the departmental level until the total utility budget is accumulated.
- Budgets are based on business indicators and activity levels for each Responsibility Center, each department and the utility in total.
- Budgets are prepared for each month of the fiscal year plus the first quarter of the following year.
- Budgets are related to a five-year financial plan. (See Paragraph 2.3.1 and Appendix 4, Long-Range Financial Planning for discussion of development of the plan.)
- Amounts above or below the budgeted amounts will be explained by the manager of every Responsibility Center at the end of each period.

### 1.3.1 Responsibility Centers

Establish responsibility centers. The organizational basis for the budgeting, accounting and reporting systems recommended in this Report is responsibility centers. They are the organizational units that are subject to the direction of an individual who has been assigned the responsibility and delegated the authority to accomplish specified objectives. Typically these objectives include both operating and financial goals.

The essence of responsibility accounting is the accumulation of revenues, costs and operating data according to areas of responsibility in order that deviations from budgets can be identified with the responsible manager. Reports prepared along responsibility lines are in effect "report cards" which inform the manager and his superior how well he has performed against plan. The objective is not to find fault. To be effective, control systems locate those areas in need of help so that assistance can be given and the scarce resources of the firm utilized more effectively.

The responsibility centers recommended for the utilities are shown in Exhibit 1.4. Ideally each of these centers should:

- Have a single responsible manager.
- Control a substantial amount of resources (people, facilities, equipment or money).
- Be easily differentiated from other parts of the utility.

More detailed discussion of the criteria for selecting these centers will be found in Appendix 2, Responsibility Center Development.

### 1.3.2 Budgeting Process

Improve the budgeting process. The budgeting system of the utilities can be substantially improved. The recommended process for developing the operating budget consists of nine steps:

- Assign budgeting responsibility.
- Write a budget manual.
- Require responsibility managers to prepare expense estimates.
- Prepare revenue and general expense estimates.
- Prepare capital projects estimates.
- Prepare estimates of other capital requirements.
- Consolidate requests and prepare analyses.
- Approve budget proposals.
- Give each manager an approved budget.

Details concerning each of these steps are provided in Appendix 3, Budgeting Process.

### 1.3.3 Budget Changes

Budgets are estimates. Situations may arise during the year that require a change in the budget. In that case the following procedure should be used:

- The Responsibility Center Manager should submit a request for a change in the budget to the Budget and Cost Department.
- The Budget and Cost Department should review the request. Additional justification may be requested from the Responsibility Center Manager. The Budget and Cost Department should then submit a recommendation for action to the Management Committee.
- The Management Committee should approve or disapprove the request.
- Approval of the Board of Directors and the State should be requested if required.
- When all approvals are complete, the Budget and Cost Department should revise the official budget and notify the Responsibility Center Manager.

PERCENT VARIATION OF ACTUAL EXPENSES  
FROM THE ORIGINAL BUDGET

	GOGCWS	AWGA	GOSSD
PERSONNEL			
1976	- 14%	- 9%	N.A. <sup>(4)</sup>
1977	- 10	- 7	- 16%
MATERIALS			
1976	-19%	4%(1)	N.A.
1977	- 4%	-22%(1)	-30%
SPARE PARTS AND MAINTENANCE MATERIALS <sup>(2)</sup>			
1976	0%	62%	N.A.
1977	0	-59	-36
SERVICES			
1976	-16%	1%	N.A.
1977	1	11	-31
CURRENT TRANSFERS			
1976	12%	14%	N.A.
1977	4	4	-59
SPECIFIED TRANSFERS			
1976	729%	-70%	N.A.
1977	21	- 4	11

Notes: (1) Excludes internal production at cost.

(2) Included in Materials above.

(3) Detailed budget data were not available from SCA.

(4) N.A. = Not available.

Sources: Annual financial statements

PERCENT CHANGE FROM THE ORIGINAL  
APPROVED BUDGET TO THE ADJUSTED BUDGET

BUDGET CATEGORY	GOGCWS	AWGA	GOSSD
PERSONNEL			
1976	0	(1) N.A.	N.A.
1977	0	0	16%
MATERIALS			
1976	19%	7%	N.A.
1977	4	3	3
SERVICES			
1976	16%	11%	N.A.
1977	1	24	7
CURRENT TRANSFERS			
1976	12%	0	N.A.
1977	4	0	0
SPECIFIED CURRENT TRANSFERS			
1976	829%	0	N.A.
1977	21	0	12

Note: (1) Adjusted budget figure was not available.

Sources: Annual financial statements

RATIO OF PERSONNEL TO WATER  
PUMPED OR SEWAGE COLLECTED(1)

YEAR	GOGCWS	AWGA	SCA	GOSSD CAIRO (4)
1973	11.7	10.0	(3)	14.7
1974	10.9	11.7	(3)	14.0
1975	11.7	12.7	N.A.	14.4
1976	11.6	13.7	8.6	16.4
1977	11.1	12.5	6.5	19.2
1978 <sup>(2)</sup>	11.4 <sup>(2)</sup>	11.6	N.A.	19.1
1979 <sup>(5)</sup>	13.3	N.A.	N.A.	N.A.

- Notes: (1) Number of Personnel ÷ Million M<sup>3</sup> of water pumped or sewage collected.  
 (2) Actual results.  
 (3) Insignificant operations.  
 (4) Actual personnel ÷ Estimated sewage collected.  
 (5) Proposed budget for 1979.

Sources: Annual financial statements, 1978 budgets and field interviews

RECOMMENDED RESPONSIBILITY CENTERS

<u>Responsibility Center Number(1)</u>	<u>Description</u>	<u>Type of Utility(2)</u>
1	GENERAL MANAGEMENT	S, W
11	Chairman's Office	S, W
12	Management Services	S, W
2	ADMINISTRATION	S, W
21	General Administration	S, W
22	Personnel	S, W
23	Administrative Services	S, W
24	Materials Management	S, W
241	Materials Control	S, W
242	Purchasing	S, W
25	Stores	S, W
251	Stores Administration	S, W
252	Store 1	S, W
25X	Other Stores	S, W
26X	Other Stores	S, W
3	FINANCE	S, W
31	General Finance	S, W
32	Data Processing	S, W
33	Financial Control	S, W
34	Customer Service	S
4	CUSTOMER SERVICE	W
41	General	W
42	Customer Accounts	W
43	Meter Repair Shop	W
44	Service Centers	W
441	Center 1	W
44X	Other Centers	W
45X	Other Centers	W
5	OPERATIONS	S, W
51	General	S, W
52	Facilities and Maintenance	S, W
521	Fleet Shop	S, W
52X	Other Shops	S, W
53	Production	W
53	Treatment	S
531	Plant 1	S, W
5311	Plant Administration	S, W
5312	Plant Operations	S, W
5315	Plant Maintenance	S, W
53X	Other Plants	S, W
54X	Other Plants	S, W
55	Wellfields	W
551	Wellfields	W
55X	Other Wellfields	W
56X	Other Wellfields	W

Note: (1) This code number will be used for accounting  
(2) S = Applicable to a sewerage utility,  
W = Applicable to a water utility.

RECOMMENDED RESPONSIBILITY CENTERS

<u>Responsibility Center Number(1)</u>	<u>Description</u>	<u>Type of Utility(2)</u>
57	Pumping or Boosting Stations	S, W
571	Station 1	S, W
57X	Other Stations	S, W
58X	Other Stations	S, W
59	Laboratories	S, W
71	Distribution	W
71	Sewage Collection	S
711	General	S, W
721	Branch	S, W
71X	Other branches	S, W
9	TECHNICAL	S, W
91	General	S, W
92	Project Management	S, W
93	Civil Engineering	S, W
94	Mechanical and Electrical Engineering	S, W

Note: (1) This code number will be used for accounting.  
(2) S = Sewerage utility, W = Water utility

## 2.0 CAPITAL PROGRAMMING

### 2.1 IMPORTANCE OF CAPITAL PROGRAMMING

#### 2.1.1 Objectives

The capital programming process should meet three basic objectives:

- Anticipate needs.
- Acquire and allocate resources to meet the needs.
- Provide procedures and checkpoints to control implementation of the program.

The adequacy with which the utilities meet these objectives is discussed in Paragraph 2.2.

#### 2.1.2 Size of Capital Programs

Each of the utilities involved in this study is greatly expanding its capital program. Table 2.1 on the following page shows the proposed value of capital expenditures for 1979 compared to actual expenditures in 1977. Table 2.2 shows the estimated total value of capital expenditures for the period 1979-1983.

The rapid expansion in the capital programs of the utilities will severely tax their ability to plan and control them. The high cost of these programs must be met by future revenues which should be planned now.

TABLE 2.1  
CAPITAL EXPENDITURES  
1977 VERSUS 1979

<u>Organization</u>	<u>Capital Expenditures</u> <sup>(1)</sup>		<u>Percent Increase</u>
	<u>1977 Actual</u> (LE Millions)	<u>1979 Proposed</u> (LE Millions)	
AWGA	7.5	26.9	258%
GOGCWS	14.8	91.6	519
GOSSD	25.4	110.4	334
SCA	1.7	12.1	611

Note: (1) All foreign currencies converted to Egyptian pounds at the incentive rate.

Sources: Annual statements and five-year plans.

TABLE 2.2  
ESTIMATED CAPITAL EXPENDITURES  
1979-1983

<u>Organization</u>	<u>Value</u> (LE Millions)
AWGA	77 <sup>(1)</sup>
GOGCWS	373
GOSSD	769
SCA	44

Note: (1) 1979-1982 expenditures only.

Sources: Five-year annual plans.

## 2.2 FINDINGS AND CONCLUSIONS

### 2.2.1 Needs

Needs have not been met. Everyone agrees that the water and sewerage needs of the study areas have not been met.

Evidence includes:

- Unserviced areas. Not all households are served by potable water. Table 2.3 provides a rough estimate of unserved households though the data include areas outside the service areas of the utilities studied.

TABLE 2.3

<u>UNSERVED HOUSEHOLDS</u>	
<u>Governorate</u>	<u>Percent of Households</u> <sup>(1)</sup>
Cairo	19.3
Alexandria	10.4
Suez	35.1
Ismailia	70.1
Port Said	13.1

Note: (1) Estimated percent of households without a tap inside the building.

Source: Central Agency for Public Mobilization and Statistics.

- Low pressure and low quality water. There are continual complaints about low pressure and dirty water. A limited review of utility records indicates that these incidents do occur.
- Delays in extending service. Delays in extending service to customers can be as long as one year in Greater Cairo and as much as six months in other cities.
- Frequent breakdowns of equipment. Old, worn-out equipment and facilities frequently break down often causing significant inconvenience to the public.

These needs have not been met because:

- There has been a severe lack of money for new construction while the demand for service has increased substantially.
- Utilities have not planned their physical and financial needs beyond annual budget intervals.

Money has become available recently and foreign consultants have been hired to develop long-range plans. Nevertheless, each of the preceding problems may well reappear in the future as will be shown in the next paragraph.

## 2.2.2 Acquisition and Allocation of Funds

The acquisition and allocation of funds should be improved.

2.2.2.1 Need for a plan. A long-range plan is essential because:

- Not all desired projects can be started immediately. A good plan ensures that priorities are based on proper consideration of needs. It can also be used to explain the timing of projects to the public.
- Demand for facilities must be anticipated in advance:
  - . Major projects require up to five years to design and build.
  - . Inadequate networks are expensive to replace.
- Utilities must be able to evaluate the impact of debt service requirements on future financing.

2.2.2.2 Need for a planning process. Consultants have been engaged to recommend long-term construction programs to the utilities. The Tariff Study includes recommendations for revenue financing. Nevertheless, changes from these recommendations can be expected:

- The utilities are apparently prepared to approve the plans in general but not in detail. Numerous changes are then likely to be made without explicit consideration of their impact on the total plans.
- The needs and limitations of both the utilities and the areas served are likely to change. The present plans should then be changed to meet the new conditions.

The process for evaluating and approving these changes does not exist:

- No one has been charged with the responsibility of regularly reviewing and updating both the long-range construction and financial plans. The technical departments have been most active in planning but their focus is on physical facilities.
- Few policies, guidelines or procedures for estimating needs, establishing priorities, or developing proposals have been established.
- Some of the data required to update the plan are either not:
  - . Systematically gathered (e.g., proposed future construction by developers, government and private industry), or
  - . Adequately analyzed (e.g., detailed demand by area).
- The Ministry of Planning requires preparation of annual capital budgets. Though it reviews all projects and specifies which are to be done, the review is limited by both time and the amount of available information. The real concern is allocation among regions and organizations rather than among specific projects.

2.2.2.3 Financial planning. Significant attention is being given to physical planning by the utilities, but little attention has been given to financial planning. Financial planning is needed because:

- Debt service charges are expected to become a major component of the cost of water as shown in Table 2.4.

TABLE 2.4  
DEBT SERVICE COSTS

<u>Organization</u>	<u>Debt Service Per Cubic Meter of Water Produced</u>	
	<u>1977</u> (Milliemes)	<u>Estimated 1985</u> (Milliemes)
AWGA	7.1	29
GOGCWS	3.8	51
GOSSD	0.9 <sup>(1)</sup>	74 <sup>(1)</sup>
SCA	N.A.	107

Notes: (1) GOSSD debt service divided by estimated sewage collected in Alexandria and Cairo.

Source: Annual reports for 1977 and field interviews. Estimates for 1985 by BVI-ATK Associates.

Provision must be made for these expenditures.

- Sources of large loans must be located.  
(See Table 2.2)
- Tariff rate increases must be anticipated and applications made for them.
- Top management must be able to evaluate the financial impact of proposed new programs.

Only AWGA had a financial plan at the time of this Study. The Tariff Study team will present a proposed financial plan for each utility but these plans will require review, approval and annual updating. A review and approval process does not presently exist nor have responsibilities for it been assigned.

2.2.2.4 Budgets. The annual budget is the primary mechanism for allocating resources. It suffers from numerous problems:

- There are few policies, guidelines or procedures for determining needs:
  - . The technical departments are formally responsible for preparing capital estimates for plants and networks.
  - . No procedures exist for identifying other needs.
  - . Capital needed to support accounts receivable and inventories is particularly slighted.
- There is a lack of justification for projects. The following are either missing or inadequate:
  - . Analysis of demand
  - . Analysis of level of service
  - . Analysis of replacement needs
- There are no guidelines or policies for setting priorities among capital needs.
- The one year budgetary time frame imposed by the State is inappropriate since many projects require several years for execution.
- The potential sources of funds for projects are not clearly identified.

As a consequence:

- Priorities depend upon the judgement of senior officials rather than on an analysis of needs.
- Important needs are ignored or slighted.
- Substantial cuts are made by the Ministry of Planning in the capital budget, occasionally upsetting priorities of the Authorities.

### 2.2.3 Control Mechanisms

Control mechanisms are weak. The shortage of engineers has forced the utilities to:

- Entrust large projects to junior engineers.
- Load experienced engineers with many projects.

Good project plans and reports can partially offset the poor effects of these actions.

2.2.3.1 Project plans. Project plans often lack the level of detail required for control. Tasks, for example, are often not appropriately designed:

- Tasks are sometimes too large. Cost overruns can then become unnecessarily large before they are identified.
- Task periods are sometimes too long. As a result delays can be considerable before they are measured.
- Relationships between tasks may not be clearly defined. The effect on other tasks of a delay in one cannot be measured.

Cost estimates are often inaccurate. The reported cause of inaccuracies is that the plans themselves lack sufficient detail to provide good estimates. As a result, evaluation of forecasted costs to completion versus budgeted costs are usually difficult to make with confidence.

2.2.3.2 Reports. All of the major utilities require monthly progress reports on projects. These reports range from a summary of all projects showing actual costs versus budget to significant detail on individual projects. In general, these reports are:

- Timely.
- Used by managers.

Nevertheless, their accuracy and usefulness are limited by the quality of the project plans themselves.

## 2.3 RECOMMENDATIONS

### 2.3.1 Long-Range Plans

Formally approve a long-range plan.

2.3.1.1 Composition of the plan. Each utility should prepare a long-range plan which should consist of at least three elements:

- Facilities Plan. The facilities plan should contain estimates of the number and distribution of people to be served, the amount of water required, and the physical facilities required to produce and distribute the water and administer the utility.
- Manpower Plan. The manpower plan should consist of a summary of specific skills, numbers and types of people needed by department and location for each of the next five years. The summary should be supported by utilization, hiring and training plans. (See Paragraph 4.1.6 and Appendix 5 of the Personnel Systems Report for details.)
- Financial Plan. The financial plan should contain detailed estimates of revenues, expenses and capital expenditures for each of the next five years.

The reports presently being prepared by consultants can be used to establish the first plans. Thereafter, the plans should be updated each year.

2.3.1.2 Review consultants' reports. The consultants' reports presently being prepared should be reviewed, changed as required and formally approved. The procedure described below should be followed:

- Assign the responsibility for managing the review and approval process to one senior manager. (The Long-Range Planning Manager.) This manager must have a general management perspective since both cost and technical factors must be considered.

- Review the consultants' recommendations critically:
  - . Look for alternatives that might prove less expensive.
  - . Prepare a chart of what is to be done each year.
  - . Prepare a long-range financial plan for each year. (See Appendix 4, Long-Range Financial Planning.)
- Prepare a detailed long-range plan and submit it to the Board of Directors for approval. It should also be sent to the Ministries of Housing and of Planning (after Board approval) as part of the annual budget.

2.3.1.3 Update the long-range plan annually. Conditions in both the utilities and the areas served will change. Therefore, the long-range plan should be reviewed every year. These steps should be followed:

- Assign the responsibility to a senior manager as described in Paragraph 2.3.1.2.
- Review the needs of the utility's service area:
  - . Review the definition of the service area.
  - . List major housing or industrial projects requiring water or sewerage services during the next two years.
  - . Estimate the number of unserved households in each service area.
  - . Estimate the number of new connections by branch for each of the next three years.
  - . Forecast per capita consumption and total demand of each branch for each of the next ten years.
  - . Review estimates and preliminary project proposals with other water or sewerage utilities in the service area.

- Review the utility's internal needs:
  - . Use the demand forecasts to estimate required production from each water plant.
  - . Use existing design, pressure and output data to estimate the capability of each plant to meet the demand. Compare that capability to the need.
  - . Review projects under construction and evaluate the time and cost to completion and their impact on production.
  - . Review the needs for expansion with technical managers and develop a list of projects required to meet them.
  - . Summarize the benefits and costs of each proposed project. (See Exhibit 2.3 of the Procedures and Methods Report for methodology.)
  - . Request all managers to submit a list of future facility and equipment requirements (excluding projects discussed above).
  - . Estimate the impact of new projects on manpower requirements.
- Update the long-range plan:
  - . Set priorities among the new and replacement projects and other capital acquisitions. (See Exhibit 2.6 of Procedures and Methods Report for details.)
  - . Determine the approximate timing of the projects and capital acquisitions.
  - . Estimate (roughly) the cost of the projects and capital acquisitions.
  - . Prepare a five-year financial plan. (See Appendix 4.)
  - . Prepare a five-year manpower plan.
  - . Present the updated plan consisting of the Facilities, Financial and Manpower plans to the Board of Directors for review and approval.

2.3.1.4 Obtain benefits. The principal benefits of long-range planning are:

- Future needs are more likely to be identified in sufficient time to meet them.
- Better judgements can be made when allocating capital for current projects.
- Today's capital requirements can be more clearly demonstrated to higher authorities and the public.

### 2.3.2 Project Control

Plan project control points. Projects should be planned to simplify control. The following guidelines will help:

- Define task elements that are short and small enough so that a substantial overrun on one task is not a substantial overrun for the entire project.
- Define the tasks so that the completion point can be clearly identified.
- Prepare a flow chart that shows how the tasks are related. It should show which tasks must be completed before others can be done. See Exhibit 2.5 of the Procedures and Methods Report for methodology.
- Estimate the time, cost and completion date for each task.
- Base contractors' advance payments upon task completion to the extent possible.

The major benefits of following the above guidelines are:

- Senior management will have closer control over projects managed by junior engineers.
- Alternate courses of action will be easier to identify and control when overruns appear.
- The impact on total time and cost can be more easily calculated when overruns appear.

This system should also improve cost estimating if enough tasks are identified.

### 2.3.3 Capital Budget

#### Develop an annual capital budget.

2.3.3.1 Assign responsibility. The Management Committee should have overall responsibility for developing the annual capital budget which should be done within the framework described in Appendix 3. The Committee should appoint one person, the Capital Budget Manager, to manage the day-to-day process. This person must have a general management perspective because the needs of various departments must be considered.

2.3.3.2 Select capital projects. The most important task in developing the capital budget is the identification, selection and justification of capital projects. These topics are described in greater detail in the Procedures and Methods Report. The basic process should be to:

- Prepare a list of all projects that will continue into the budget year. Estimate the time and cost to be spent on each during the budget year.
- Review the new projects proposed for the budget year in the current long-range plan. Make any adjustments that seem reasonable in view of recent events. Obtain the Management Committee's approval of the list.
- Prepare detailed cost estimates and justification of each project. (This task should have begun when the project was approved in the long-range plan.) The project proposal originally prepared as part of the long-range planning process should be amplified and updated using the form in Exhibit 2.1 for projects scheduled to begin during the budget year.
- Establish priorities on the projects and present them to the Management Committee for review and approval.

2.3.3.3 Review other capital expenditures. Not all capital expenditures can be classified as capital projects. Furniture and cars are good examples. The form shown in Exhibit 2.2 should be used to identify and justify such requirements. It should be included in the budget manual and submitted by managers along with their operations budget request. The Capital Budget Manager should review these requests, establish priorities for them, and present the list to the Management Committee for approval.

2.3.3.4 Review operating capital requirements. Capital is required to support operations, especially accounts receivable and commodity inventories. Appendix 3 describes how estimates of changes in these assets should be prepared. The Capital Budget Manager should review these estimates and present his recommendations to the Management Committee.

2.3.3.5 Review loan principal payments. Appendix 3, Exhibit A3.39 shows the form that lists all principal and interest payments for the year. The principal payments shown there should be incorporated in the capital budget.

2.3.3.6 Prepare a Sources and Uses of Funds Statement. All of the foregoing analysis should be summarized into a Sources and Uses of Funds Statement for capital funds. The form is shown in Appendix 3, Exhibit A3.24. For analysis by the Management Committee, all foreign currencies should be translated into Egyptian pounds. Separate statements in local and foreign currencies may be helpful in later presentations to the appropriate Ministry. The Sources and Uses of Funds Statement should be supported by the schedules discussed in Paragraphs 2.3.3.2 to 2.3.3.5.

2.3.3.7 State budget. After approval by the Management Committee, the Chairman and the Board of Directors, the Sources and Uses of Funds Statement should be transposed to fit the State budget format and then submitted for State approval.

2.3.3.8 Benefits. The benefits of a comprehensive, annual capital budget are:

- The capital needs of all functions will be identified and considered.
- Management will have a better basis for assigning priorities among competing requests.
- Management will have a clearer picture of what funds are required and their source.
- Standards for control during the year will exist.

2.3.4 Project  
Monitoring

Monitor progress.

2.3.4.1 Continue to follow time and cost. Two levels of follow-up are required, one for top management and one for members of the technical department.

The format to be used for the top management report is shown in Exhibit 2.3. The report should be:

- Prepared by Asset Accounts.
- Derived from the Project Task Analysis reports discussed below.
- Prepared monthly and delivered by the 20th of the following month.
- Given to the Manager of Projects, the Vice Chairman, Technical and the Chairman.

A series of reports titled Project Task Analysis should be prepared to assist technical management control the execution of projects. The format of these reports is shown in Exhibit

2.4. These reports should be:

- Prepared for each active project.
- Prepared by the engineer in charge of the project (with close cooperation of the asset accounts department).
- Derived from contractors' invoices, the engineer's personal appraisal of progress and from review of the project plan.
- Prepared monthly and delivered by the 15th of the following month.
- Delivered to the Projects Manager; Vice Chairman, Technical; Asset Accounts and any operating management affected by the project (e.g. plant managers).

2.3.4.2 Revise budgets. During the course of the year some capital expenditures will prove to be significantly greater or less than expected. When this deviation becomes apparent, Asset Accounts personnel or the Project Manager should initiate a review of the item or project to determine whether the budget should be revised or other corrective steps taken. Unless the change must be approved by the State, the Management Committee should approve all changes to the budget.

2.3.4.3 Obtain benefits. The principal benefits of a reporting system based on good project plans and budgets are:

- Timely identification of deviations from expected results. Managers thereby have a greater chance of solving the problem.
- Top management will obtain better estimates of the time and cost to complete projects already underway as well as future projects.

(See the Procedures and Methods Report, Section 2.0, for further discussion of project planning.)



PROJECT PROPOSAL

PROJECT TITLE \_\_\_\_\_

8. PROJECT DEFINITION			
Task Analysis	Dates		
	Start	Complete	Costs (LE)
1			
2			
3			
4			
5			
6			
7			
8			
Brought forward from attached Schedule _____			Total _____
9. INPUT COST ANALYSIS:		Costs	
	Local	Foreign	
Land			
Structures			
Equipment			
Raw Materials			
Labor			
Taxes, Tariffs and Other			
Other			
			Total _____
10. Estimated Life: _____			
APPROVED BY:  _____ Date _____  Project No. _____  Asset Ledger No. _____ Depreciation Acct. No. _____  Asset No. _____	DISAPPROVED BY:  _____ Date _____  Reason for Disapproval:		

PROJECT PROPOSAL

INSTRUCTIONS

1. Prepare a very brief descriptive title.
2. Enter the name of the person to whom all questions concerning this proposal should be addressed.
3. Enter the date the proposal is submitted to the Manager of Long-Range Planning.
4. Describe the project in general terms. The description should provide a clear indication of the scope of the project. For example:  

Build additional clarifiers at Roda. (poor)  
Build three additional clarifiers at Roda. (good)
5. Check New if the project by itself adds new capacity or capability to the utility.  
Check Addition if it extends existing capacity or capability.  
Check Replacement if it will replace existing capacity or capability.
6. Describe the objectives of project. Provide measures of how much it will expand the utility's capacity or capability. These measures should be specific enough to permit numerical analysis of the success of the project after it is in operation.

PROJECT PROPOSAL

INSTRUCTIONS (Cont'd)

7. Provide a brief statement justifying the project. This statement should be supported by appendices containing a detailed analysis of the needs, costs and benefits. The following topics should be considered either in the brief or in the appendices:
- Need for the project, for example:
    - . Size and rate of growth of customer demand
    - . Size and rate of growth of work load
    - . Change in legal requirements
    - . Change in labor force capabilities
  - Costs of the project, including:
    - . Initial cost
    - . Operating costs
  - Alternatives, including:
    - . Doing nothing (This alternative must be discussed)
    - . Other approaches to solving the needs (where possible, compare costs)
  - Benefits, for example:
    - . Quantified improvement in customer service
    - . Reduced costs
    - . Increased productivity
8. List the tasks against which the project can be controlled. This analysis should be supported by a flow chart showing the timing and relationships among the tasks.
9. Estimate the costs of the project in terms of resources required. Attach additional details, if required.
10. Estimate the lifetime of the project. This value will be used to establish the depreciation rate for the completed asset.

REQUEST FOR CAPITAL EXPENDITURE

REQUEST ORIGIN:

Responsibility  
1. Center \_\_\_\_\_ 3. Code \_\_\_\_\_  
2. Manager \_\_\_\_\_ 4. Date \_\_\_\_\_

5. DESCRIPTION OF REQUEST: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6.  New  Addition  Replacement

7. JUSTIFICATION \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. INPUT COST ANALYSIS

<u>Input Item</u>	<u>Costs</u>	
	<u>Local</u>	<u>Foreign</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
Total	_____	_____

REQUEST FOR CAPITAL EXPENDITURE

INSTRUCTIONS

1. List the name of the Responsibility Center.
2. Signature of Responsibility Center Manager.
3. Enter accounting code for the Responsibility Center.
4. Enter date of submission of this request. (To be entered by the submitting manager.)
5. Describe request in words.
6. If the item has not been previously acquired by the utility check New. If the utility already has such an item and it will continue to be used, check Addition. If the utility has such an item but it will be replaced by the purchased item, check Replacement.
7. Describe the purpose to be served by the acquisition. Justify the need for the purchase in terms of:
  - . Requirement to provide adequate service to customers.
  - . Cost savings (Provide detail demonstrating the savings. Include estimates for depreciation, interest, and operating costs for both the new equipment and any equipment to be replaced).Describe briefly other alternatives considered. (The alternative of doing nothing must be discussed). Attach additional pages if required.
8. Estimate anticipated costs. Include installation, training, inventory stock-up, other start-up costs and any other costs except normal operating costs.



PROJECT TASK ANALYSIS

Project Title: \_\_\_\_\_

Report Date \_\_\_\_\_

Project Number \_\_\_\_\_

Period Ending \_\_\_\_\_

Responsible Engineer \_\_\_\_\_

Task No.	Task	Start Date		Completion Date		This Year's Cost	
		Plan	Actual <sup>(1)</sup>	Plan	Actual <sup>(1)</sup>	Budget	Actual

Remarks:

Note: (1) Or estimated if not started or completed.

PROJECT TASK ANALYSIS

Task Description		Previous Years	Jan.	Feb.	Mar.	Apr.	May	Jun	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total <sup>(1)</sup>
Task:	Percent Complete <sup>(2)</sup>														
	Plan														
	Actual														
	Cost <sup>(3)</sup>														
	Plan														
Task:	Actual														
	Percent Complete <sup>(2)</sup>														
	Plan														
	Actual														
	Cost <sup>(3)</sup>														
Task:	Plan														
	Actual														
	Cost <sup>(3)</sup>														
	Plan														
	Actual														
Task:	Percent Complete <sup>(2)</sup>														
	Plan														
	Actual														
	Cost <sup>(3)</sup>														
	Plan														
Task:	Actual														
	Percent Complete <sup>(2)</sup>														
	Plan														
	Actual														
	Cost <sup>(3)</sup>														
Task:	Plan														
	Actual														
	Cost <sup>(3)</sup>														
	Plan														
	Actual														

- Notes: (1) Budget year only.  
 (2) Based on appropriate physical measurement (e.g., M<sup>3</sup> of concrete poured).  
 (3) Cumulative costs (LE) in budget year.

## 3.0 ACCOUNTING SYSTEMS

### 3.1 OBJECTIVES OF ACCOUNTING

The primary objectives of an accounting system are to provide:

- The data required for external reports.
- The information required for internal reports.
- The cost and financial information required for future planning.
- A record of transactions so that auditing for mistakes or improper actions can be properly and easily performed.

### 3.2 FINDINGS AND CONCLUSIONS

#### 3.2.1 External Reporting

External reporting needs are being met. Legal requirements for reporting are being met by all of the utilities. The auditors' statements have provided few criticisms of the reports.

Nevertheless, several deficiencies were noted:

- GOSSD produces neither a profit and loss statement nor a balance sheet. It is now required to provide these reports by agreement with the Arab Fund. Such reports would provide useful insight into the organization's financial affairs.
- None of the utilities present any analysis of results in their annual reports.
- All of the utilities present far too much detailed data (e.g., names of accounts payable) in their annual reports.
- None of the utilities presents a clear statement of the sources and uses of funds.

### 3.2.2 Internal Control

#### Internal control requirements are not being met.

3.2.2.1 Department costs are not identified. All of the utilities provide some form of expense reporting. All of these reports are deficient in:

- Level of detail.
- Format.
- Frequency.
- Timeliness.
- Distribution.

The cost reports of the various utilities are evaluated in these terms in Table 3.1 on the following page.

- Level of detail. None of the utilities report an appropriate level of detail. The common practice is to report costs by the four cost centers defined in the Egyptian Standard Accounting System (SAS). These reports are not useful because:
  - . Costs cannot be attributed to individual responsible managers.
  - . Dissimilar functions are put together (e.g., plant operations and plant maintenance).
- Format. Utilities commonly report current period and year-to-date actual expenses; however, there are no goals against which to compare these expenses. Without goals, managers' performance is difficult to measure.
- Frequency. All of the utilities except GOGCWS are trying to publish monthly reports. That is an appropriate time frame.
- Timeliness. Only GOSSD is producing reports in a timely manner. Reports must be produced within one month of the close of a period to be useful for control. This is especially true near the end of the year.

TABLE 3.1

DEPARTMENTAL COST REPORTS

	<u>Level of Detail</u>	<u>Format</u>	<u>Frequency</u>	<u>Timeliness</u>	<u>Distribution</u>
AWGA	Budget item expenses for each plant. Other activities are included under Administration, Marketing or Production Services.	Current and year-to-date only. No goals.	Monthly (Adequate)	Three months late in November.	Top management, sometimes to plant managers.
GOGCWS	Records of line item expenses are maintained for each plant but reports are produced only for: <ul style="list-style-type: none"> <li>- Production.</li> <li>- Production Services.</li> <li>- Administration.</li> <li>- Marketing.</li> </ul>	No goals. No comparisons.	Annually	Not obtained.	Top management.
SCA	Budget item expenses listed for each city utility.	Utility data is mixed with other SCA activities. No goals.	Monthly	As of October 1978, most recent report was for May.	City accounting managers. Data is available to utility managers if they request it.
GOSSD	Expense summary for all of GOSSD. There is no departmental detail.	Current year-to-date.	Monthly	No delay as of November 1978.	Top management and financial managers.

- Distribution. These reports tend to be distributed to top management rather than to the managers directly affected. As a result:
  - . Managers are not encouraged to be cost conscious
  - . Problems are not brought to the attention of operating managers until they have become acute.

### 3.2.2.2 Vital areas are not given enough attention.

- Fixed asset control
  - . Property records do not exist at GOSSD.
  - . Records exist but are scattered among various departments at AWGA and GOGCWS.
  - . All utilities base balance sheet values on accumulated gross additions and periodic revaluations. They are not related to individual ledger accounts.
  - . Depreciation procedures are not clearly defined. The rate categories used by the utilities are less specific than those recommended in the SAS. Rates are uniformly higher than the minimums set by SAS.
  - . No one has the continuing responsibility to:
    - Conduct appropriate inventories of fixed assets.
    - Establish procedures for assigning assets to managers.
    - Establish procedures for retiring assets.
  - . Due to the lack of control defined above, ample opportunities exist for loss, mismanagement and missappropriation.
- Accounts receivable. Accounts receivable have increased substantially at AWGA and GOGCWS as previously shown in Table 1.1. All utilities claim they turn water off when private customers become delinquent in payments. The large value of receivables suggest otherwise. The following procedures should be developed or improved:
  - . Identification of overdue accounts
  - . Turn-off of overdue accounts
  - . Special efforts to collect overdue accounts
  - . Write-off of bad debts

- Project cost estimating. Technical managers report that projects consistently overrun estimated costs and the original time budgets. Existing cost reports are adequate but the projects are not cost estimated for control when they are planned.
- Cash flow. Control of cash is important to utilities. This need will grow as large capital programs are undertaken that require management of numerous sources and uses of foreign currencies. Responsibility for cash management is typically diffused in several departments (collections, central accounting and cashier). No one is assigned responsibility for:
  - . Establishing rules for managing and accounting for cash.
  - . Forecasting sources and uses of cash.
  - . Managing available cash.

### 3.2.3 Planning Information

Planning information is inadequate. The utilities have considerable financial data available that would be useful for planning if it were converted to information. The Profit and Loss and Operations Statements are presently the primary sources for financial planning information. Data for the following analyses are available but they are seldom presented as information managers can use.

- Productivity analyses. Costs per unit of output are not measured except for plants. Even at that level, costs are not related to appropriate measures of output (e.g., maintenance costs are better related to equipment hours than to water quantity).
- Program costs. Some costs are at least partially determined by managerial decisions. Where possible, occasional analyses of present versus alternative policies should be conducted. Three obvious examples are:
  - . Preventive maintenance versus emergency repairs
  - . Frequency of billing
  - . Optimum size of inventories

Regular reports on these costs would encourage managerial attention.

- Revenue analysis. Good revenue and rate planning requires accurate knowledge of revenues. Trend analyses of average revenues by customer tariff class are not routinely available.
- Price trends. For both external reporting and internal control, the utilities should know how much of their costs are due to increased:
  - . Prices of resources.
  - . Volume of water produced.
  - . Rates of use of resources.

Such analyses are not now available.

- Depreciation. Analyses of lifetimes of equipment are required to adjust depreciation to actual experience. Present depreciation rates appear too high but good information is not available.
- Debt service expenditures. Debt service expenditures will be substantial in the future. Top management should have a clear picture of these expenditures whenever they make capital program decisions.

#### 3.2.4 Auditing

Auditing is improperly focused. The utilities have too many controls but too little control. There are several indications of too many controls:

- Documents are rechecked several times.
- Multiple signatures are required.
- Duplicate books are kept.

Evidence of lack of control includes:

- Signatures added without review of contents. (If managers read everything they signed, they could do nothing else.)
- Lack of urgency in processing documents.
- Lack of summary reports.
- Many errors in both input and output data.

- Lack of questions about the reasonableness of expenditures.
- Lack of critical review and rationalization of the accounting system.

The auditing functions in the utilities are presently:

- Trying to check all transactions rather than:
  - . Statistically selecting a limited set of transactions to audit in detail.
  - . Concentrating attention on high priority problem areas.
- Not questioning business decisions.
- Not reviewing the adequacy of the control procedures.

The result is the lack of control described on the preceding page.

### 3.2.5 Assignment of Responsibilities

Responsibilities are poorly assigned. A basic organizational principle is to group related activities together. That is not done well at the utilities. Typically the following situations are found:

- Budget and cost. These two activities are separate at AWGA and GOGCWS. GOSSD does not have a cost function. Both budgeting and costing are concerned with internal control and are closely related. They should be integrated.
- Treasury. Cash management functions tend to be spread between the cashiers department and central accounting. As a result, money management is done on a day-to-day basis with little planning. If all activities involving money were grouped under one function, better control could be achieved.
- Asset management. Responsibility for following assets is spread over stores, central accounts, operations and technical. Consequently the utilities have no unified system of accounting for responsibility, use and depreciation of plant, property and equipment.

Several responsibilities have not been assigned:

- Audit. The present auditing procedures should more properly be called checking. Responsibility for auditing systems and procedures has not been assigned. Duplicate books and large numbers of both input and output errors are the result.
- Cash forecasting. Cash forecasting is not done systematically or for periods longer than a few weeks. As a result, utilities occasionally run out of money.
- Time reporting. Department managers are not given any reports of either the number of people in their department or man-hours worked. This lack of information must be an important contributor to management's lack of concern for productivity.

### 3.3 RECOMMENDATIONS

The existing accounting system primarily serves external reporting requirements. Attempts to alter the system to provide internal control information have not met managements' expectations. Entirely new methods, procedures and accounting structures are required.

The proposed system will help meet the four accounting objectives stated in Paragraph 3.1 by:

- Reassigning accounting responsibilities. This will permit faster processing of data required for internal control. It will also simplify the auditing task.
- Improving data collection. Changes in data collection will permit preparation of control reports, provide data for planning and simplify auditing.
- Preparing control reports. Monthly reports that compare actual costs to budgets should greatly improve internal control.

- Changing accounting procedures. Accounting procedures must be changed to provide both planning and control information on a timely basis.
- Improving auditing. The scope of auditing should be enlarged to include examination of control procedures.

### 3.3.1 Accounting Structure

Reassign accounting responsibilities. A separate functional unit should be set up for each of the nine major accounting functions. The recommended units and their reporting relationships are shown in Table 3.2 on the following page.

Each unit should be responsible for:

- Checking, recording and filing all source documents relevant to its tasks.
- Maintaining detailed accounts.
- Preparing reports or forms required by other accounting functions and by other units of the utility.

More detailed discussion of the responsibilities of each unit is contained in the Organization Manual.

The structure will:

- Define responsibilities more clearly by putting all related accounting activities within a single functional unit.
- Eliminate duplicate books (though summaries of books held by one unit will be maintained by other units)
- Simplify auditing by:
  - . Assigning responsibility for approving transactions to individual units.
  - . Reducing the handling of original documents.
- Enable staged introduction of data processing equipment since each function can be automated without affecting the others.

TABLE 3.2

RECOMMENDED ACCOUNTING FUNCTIONAL UNITS

<u>Accounting Function</u>	<u>Functional Unit</u>	<u>Reports to</u>
Payroll preparation, maintenance of employee accounts.	Payroll Accounting	Administration
Financial control of inventories and materials usage.	Materials Control	Materials Management
Billing, maintenance of all customer accounts.	Customer Accounts	Customer Service
Receipts and disbursements of money.	Treasury	Finance
Maintenance of General Ledger, General Journal and preparation of financial statements.	Central Accounts	Finance
Approval of all disbursements except payroll. Maintain accounts of suppliers.	Accounts Payable	Finance
Developing budget, providing cost reports	Budget and Cost	Finance
Capital project accounting, maintenance of asset ledgers and property records	Asset Accounts	Finance
Internal auditing of system adequacy and adherence to procedures.	Audit	Chairman Management Services

### 3.3.2 Collection and Transfer of Data

#### Improve collection of cost data.

3.3.2.1 Provide data for control reports. Data collection procedures and forms must be changed. At a minimum, all expense transactions must contain a code identifying which Responsibility Center is to be charged. In many cases (especially time reporting) a job code that identifies specific activities within the Responsibility Center would be useful. Sample time and material reporting forms are shown in Exhibits 3.1 and 3.2.

3.3.2.2 Speed-up accounting process. A major problem is that much of the data are not available until long after the end of the month. To speed-up the process, time and materials data should be reported weekly. Much of the data for a month can therefore be processed before the end of the month. Both payroll and materials accounting procedures should be rewritten at all utilities. (See Appendix 7.)

3.3.2.3 Transfer accounting data with reports. At present, data are usually transferred between departments in the form of original documents. Under the proposed system, the first accounting unit to process the data:

- Reviews all documents for correctness. (No further checks are made on the original document.)
- Maintains any detailed accounts required.
- Summarizes the data required by other accounting departments in reports and forwards them to the appropriate functional unit. (See Exhibit 3.3 for a description of the reports,)
- Files the original document.

The advantages of this system are:

- Serial processing of data (which takes calendar time) is reduced.
- Only one set of detailed records must be kept.
- Auditing is simplified.
- Original documents can be changed without affecting all users. The changeover to computer processing will then be easier.

All transactions must be promptly processed in this system to avoid extensive reconciliations between departments. A single schedule of cut-off dates (weekly, monthly, quarterly and annual) used by all accounting units would encourage compliance. Table 3.3 shows a suggested schedule for report deadlines:

TABLE 3.3  
REPORT DEADLINES

<u>Report Frequency</u>	<u>Report Deadline After Closing Date</u>
Weekly	3 Working days
Monthly	10 Working days
Quarterly	15 Working days
Yearly	60 Working days

If managers adhere to these schedules, control reports can be produced in a timely manner.

### 3.3.3 Control Reports

Prepare control reports. Five kinds of financial control reports should be prepared regularly by the accounting units:

- Financial statements
- Budget versus actual reports
- Cash flow projections
- Pricing reports

3.3.3.1 Financial statements. With the exception of GOSSD and SCA, the financial reports appear adequate for external reporting and should be continued. Recommendations for preparation of financial statements for GOSSD and SCA are given in Appendix 5.

3.3.3.2 Budget versus actual reports. The Budget and Cost Department should provide each Responsibility Center with a comparison of actual costs and budgeted costs. These statements should be:

- Prepared for each month.
- Distributed by the 20th of the following month.
- Given to both the Responsibility Center Manager and his immediate superior.

Two formats should be used for these reports, one for primary and another for summary responsibility centers<sup>(1)</sup>. Budget item detail (wages, commodities, services, and transfers) should appear in the Budget Versus Actual statements of primary

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Note: (1) A Summary Responsibility Center is a consolidation of lower level primary responsibility centers.

responsibility centers. A summary responsibility report should show only the total expenses (actual and budgeted) of those centers that comprise the summary center. Exhibit 3.4 indicates the detail appearing on various levels of reports.

The suggested format of the Budget versus Actual statement for water treatment plants is shown in Exhibit 3.5. Reports for other primary responsibility centers follow the same format but use the line items checked on Exhibit 3.6. Customer Service Centers have responsibility for revenues as well as expenses. Consequently they should receive the report shown in Exhibit 3.7 as well as an expense report.

These reports require a written response from managers when expenses differ from budget by more than 10% (or whatever rate is set by the manager's superior). See Paragraph 4.3.3.2 for more details on response to reports.

These reports should produce the following benefits:

- Managers' performance can be measured quantitatively.
- Managers are encouraged and enabled to control costs.
- Future costs can be more accurately estimated.

3.3.3.3 Cash flow reports. Cash flow projections are required to anticipate and plan the cash needs of the utility. They should be prepared monthly by the Treasury Department. The suggested format for operations cash flow is shown in Exhibit 3.8. Separate statements should be prepared for local capital funds and foreign funds. Exhibit 3.9 presents the format for local capital funds. Similar statements should be prepared for foreign funds.

The Treasury Department is the principal user of the statements but copies should also be given to the Vice Chairman, Finance and the Chairman.

3.3.3.4 Pricing reports. For both external reporting and internal control, utilities should be able to separate controllable costs from uncontrollable costs. Utilities cannot usually control price increases. Therefore they should be able to calculate and separate the effect of such increases from other costs. Such data will also be useful for budgeting. A suggested report format is shown in Exhibit 3.10. Similar reports should be prepared for other major raw material inputs and for average salaries of Grades 4, 5 and 6. These reports should be prepared by the Budget and Cost Department.

3.3.3.5 Special cost reports. Other cost reports besides those provided for the responsibility centers may be needed.

The Responsibility Center data can be used directly to provide the Cost Center data required by the SAS. Exhibit 3.11 shows how the results of the responsibility centers can be combined to yield cost of Production, Production Services, Marketing and Administration.

Management has considerable discretion in requesting maintenance funds. To justify these requests may require considering the total cost of plant maintenance. This can be done by summing the results of all plant maintenance responsibility centers (Centers 53x5 and 54x5).

3.3.3.6 Job accounting reports. Frequently managers should know the cost of activities that occur for a limited amount of time. These costs could be tracked by assigning a unique responsibility center number to each such activity. This method would confuse managerial responsibility and generate too much paperwork. Instead, a job accounting system should be installed.

This system is described in detail for operations maintenance and networks maintenance in Exhibits 3.6 and 3.9 of the Procedures and Methods Report. Projects may be tracked the same way by using the project number as a job number.

The major change in data collection procedures required to support this system is providing space for a job number on the individual time report (See Exhibit 3.1.) and on the Materials Requisition. (See Exhibit 3.2.)

The responsibility of collecting and analyzing the cost and man-hour data should be assigned to various accounting departments. Each month Payroll and Materials Control should transmit an analysis of time and materials costs respectively to Budget and Cost. Budget and Cost can then prepare an analysis of monthly and job-to-date expenses for each job and send it to the responsible manager. Project costs are reported by Asset Accounts as described in Paragraph 2.3.4.1.

3.3.3.7 Importance of cost reports. Both cost and operating reports are required if managers are to perform properly. More attention is given to cost reports in this Study because of their complexity and impact on the accounting system, not because they are more important.

### 3.3.4 Accounting Policies and Procedures

Change accounting policies, books and procedures.

To meet the needs of the today's larger organizations, changes should be made in the following areas:

- Accounting policies
- Accounting books
- Accounting procedures

3.3.4.1 Accounting policies. Accounting policies in the following areas should be reviewed and clearly defined in writing:

- Recognition of revenues
- Provision for bad debts
- Write-off of bad debts
- Disposition of unpaid wages
- First year depreciation
- Definition of a capital expenditure
- Definition of a fixed asset
- Capitalization of facilities donated by customers
- Timing of payments to suppliers
- Signatures required for expenditures
- Expenditure authority of Responsibility Center managers

3.3.4.2 Accounting books. The number, type and format of accounting books used by the Utilities should be substantially changed. The accounting books that should be maintained are listed in Exhibit 3.12 and are described in Appendix 6. Books of original entry (subsidiary journals) should be maintained by the Treasury, Customer Accounts, Payroll, Materials Control and Asset Accounts departments. These journals should be posted to the General Journal at the end of each month. This method of keeping books:

- Eliminates multiple entries of the same transactions.
- Reduces the volume of paper moving between departments.
- Simplifies reconciliation of books.
- Simplifies auditing.
- More clearly identifies who is responsible for authorizing transactions.

The existing subsidiary ledgers should be retained although modifications may be required to meet the needs of the new system. The Fixed Asset Ledger and the Fixed Assets Under Construction Ledgers should be improved and regularly updated. (In the case of GOSSD they should be developed.) In addition to the existing subsidiary ledgers, several new ones should be maintained:

- Long-Term Loans
- Bidders Deposits

The utilities should also keep several analysis books. In format these books are subsidiary ledgers but their principal use is for management control. Most of them are required in order to classify expenses by Responsibility Center. They do not have to be reconciled with the financial books since

management control does not require 100% accurate figures. The Inventory by Stores Ledger and the Unpaid Wages Book are an integral part of the accounting system and should be reconciled periodically with the other books.

3.3.4.3 Accounting procedures. Accounting procedures should be reviewed and rewritten with the objective of:

- Reducing paper flow.
- Reducing signatures.
- Increasing control.
- Using subsidiary journals.
- Improving ease of auditing.

Appendix 7 outlines new accounting procedures for the following types of transactions:

- Payroll
- Purchase of Commodities
- Use of Commodities
- Purchase of Services
- Purchase of Contracted Fixed Assets
- Billing and Collections

The procedures for accounting for depreciation and maintaining property records are discussed in the Water Utility Inventory and Valuation Report.

3.3.4.4 Compatibility with SAS. The recommended system does not contradict the SAS but rather provides procedures that enable its application to a large utility. Line items will be numbered as recommended in SAS and the General Ledger will be organized around the recommended operating and balance sheet accounts. The use of subsidiary journals and ledgers and of analyses books are permitted by SAS. These books will be

organized so that reconciliation with the General Ledger is easily done. As discussed in the Water Utility Inventory and Valuation Report, property accounts will not follow the SAS in the subsidiary ledgers though they can be easily transformed.

3.3.4.5 Standard cost system. After several years of experience with the system described here, consideration should be given to establishing a standard cost system. The primary difference between the system recommended here and a standard cost system is that actual costs would be compared to a pre-determined (i.e., standard) cost per unit of production rather than to a fixed budget value. Such a system more truly represents the costs for which a manager can be held responsible.

A standard cost system should not be considered immediately because:

- The historical data required to set good standards are not readily available.
- Managers would require considerable training to understand and use the system.
- The national budget holds managers responsible for a firm budget, not a variable budget based on production.

### 3.3.5 Auditing

Improve auditing. Improve control by redirecting the focus of auditing:

- Eliminate 100% checking of all transactions and institute spot checks with frequency depending on:
  - . Value of transaction.
  - . Opportunity for error.
  - . Opportunity for misappropriation of funds.
- Begin a systematic and critical review of control systems. The order of priority should be:
  - . Billing control.
  - . Payroll control.
  - . Inventory records.
  - . Purchasing control.
- Audit timeliness and appropriateness of accounting transactions as well as accuracy.
- Install control totals on accounting transactions. (See Data Processing Report for details.)
- Reduce signatures on all documents to a maximum of two.

TIME REPORT

NAME \_\_\_\_\_

RESPONSIBILITY CENTER \_\_\_\_\_

EMPLOYEE CODE \_\_\_\_\_

WEEK ENDING \_\_\_\_\_

			DATE							
WORK DESCRIPTION	Resp. Center	Job Number	HOURS SPENT							
			SAT.	SUN.	MON.	TUES.	WED.	THURS.	FRI.	TOTAL
TOTAL										

STANDARD JOB CODES (1)

DAY OFF	XXX	VACATION	XXX	JOB ACCIDENT	XXX	ADMINISTRATION	XXX
HOLIDAY	XXX	SICK	XXX	TRAINING	XXX		

Note: (1) XXX represents a 3 digit code unique for each job.

**MATERIALS REQUISITION**

User Serial No.:

Store Serial No.:

Responsibility Center Code:

Date Submitted:

Date Filled:

Requested by: \_\_\_\_\_ (Name) \_\_\_\_\_ (Title) Store: \_\_\_\_\_ (Type) \_\_\_\_\_ (Code)

Approved by: \_\_\_\_\_ (Name) \_\_\_\_\_ (Title) Location: \_\_\_\_\_

Deliver to: \_\_\_\_\_ Location: \_\_\_\_\_

Job Number	Gate Pass	Item Code	Description	Unit Code	Quantity Requested	Quantity Issued	Condition Code	Unit Cost		Total Cost	
								LE	Mil-liemes	LE	Mil-liemes

Issued by: \_\_\_\_\_ Received by: \_\_\_\_\_

Unit Code:

K=Kilogram L=Liters U=Units G=Grams M=Meters

Condition Code:

U=Used S=Scrap N=New

ACCOUNTING REPORTS

<u>Prepared By</u>	<u>Report Title</u>	<u>Report Substance</u>	<u>Distribution</u>	<u>Frequency</u>
Payroll Department	Payroll Analysis	Summarizes payroll by Responsibility Center by line item	Budget and Cost	Monthly
	Payroll Listing	Provides payroll detail for each employee and worker. Provides a total expense by line item	Treasury, Central Accounts	Monthly
	Job Analysis	Provides time and personnel costs charged to each job number	Budget and Cost	Monthly
	Accounting Entry Statement	Summarizes transactions in the Payroll Journal that affect General Ledger Accounts	Central Accounts	Monthly
	Trial Balance	Balance of payroll accounts	Central Accounts	Monthly
Materials Control	Commodities Usage by Responsibility Center	Summarizes materials delivered by Responsibility Center	Budget and Cost, Operations Statistics	Monthly
	Commodities Usage by Job Number	Summarizes value of commodities used by job number	Budget and Cost	Monthly
	Accounting Entry	Summarizes transactions in the Purchases Journal and Commodities Usage Journal that affect General Ledger accounts	Central Accounts	Monthly
	Trial Balance	Balance in all Materials summary accounts	Central Accounts	End of month

ACCOUNTING REPORTS

<u>Prepared By</u>	<u>Report Title</u>	<u>Report Substance</u>	<u>Distribution</u>	<u>Frequency</u>
Purchasing	Accounting Entry Statement	Summarizes expenses associated with a Purchase Order	Materials Control	When purchase order is complete
Customer Accounts	Water Sales and Collections	Summarizes water (sewer services fees) billed and collected by type of water by service area by type of customer	Budget and Cost	Monthly
	Connections Report	Summarizes value of connections completed by Service Center	Budget and Cost	Monthly
	Accounting Entry Statements	Summarizes transactions in the Water Sales, Sewer Use Fees and Connections Journals that affect General Ledger accounts	Central Accounts	Monthly
	Trial Balance	Balance in customer summary accounts	Central Accounts	End of month

ACCOUNTING REPORTS

<u>Prepared By</u>	<u>Report Title</u>	<u>Report Substance</u>	<u>Distribution</u>	<u>Frequency</u>
Treasury	Services by Responsibility Center	Provides an analysis of service costs charged to each Responsibility Center	Budget and Cost	Monthly
	Accounting Entry Statements	Summarizes transactions in the Cash Receipts, Non-Cash Receipts, Cash Payments and Bank Payments Journals that affect General Ledger accounts	Central Accounts	Weekly End of month
	Trial Balance	Balance in banks and cash on hand	Central Accounts	End of month
	Cash Flow Projections	See Paragraph 3.3.3.3	Vice Chairman, Finance	Monthly
Accounts Payable	Trial Balance	Balance in suppliers accounts at end of month	Central Accounts	Monthly

ACCOUNTING REPORTS

<u>Prepared By</u>	<u>Report Title</u>	<u>Report Substance</u>	<u>Distribution</u>	<u>Frequency</u>
Central Accounts	Miscellaneous Expenses	All expenses except payroll, inventory use and service, classified by Responsibility Center (from the General Journal)	Budget and Cost	End of month
	Miscellaneous Income	All income except customer collections and connections classified by Service Center	Budget and Cost	End of month
	Accounting Entry Statements	Provides instructions for adjusting or reversing entries found to have been error	As required	As required
	Financial Statements	See Appendices 5 and 8	See Appendices 5 and 8	See Appendices 5 and 8
	Trial balance	Balance of accounts	Central Accounts	End of month

ACCOUNTING REPORTS

<u>Prepared By</u>	<u>Report Title</u>	<u>Report Substance</u>	<u>Distribution</u>	<u>Frequency</u>
Asset Accounts	Depreciation	Lists depreciation by Responsibility Center	Budget and Cost	End of Year for - Current Year Final - Next Year Est.
	Accounting Entry Statements	Provides account adjustment information to Accounts Payable	Accounts Payable	As required
		Summarizes transactions in the Capital Expenditures journal that affect General Ledger Accounts	Central Accounts	Monthly
	Top Management Project Summary	Lists project costs by project	Budget and Cost, Projects Department	Monthly
	Trial Balance	Lists balances in all capital asset and depreciation accounts	Central Accounts	Quarterly End of Year
Budget and Cost	Budget versus Cost	See Paragraph 3.3.3.2	Responsibility Center managers and their immediate superiors	Monthly
	Program Cost Reports	See Paragraph 3.3.3.5	As determined by management	As Required by Management
	Job Accounting Report	Summarizes time and materials costs for each job	Manager who authorized the job	Monthly

COMPARATIVE BUDGET VERSUS  
ACTUAL REPORT FORMATS

<u>BUDGET VERSUS ACTUAL</u>		
April 1980		
	<u>Budget</u>	<u>Actual</u>
Operations	XXX	XXX
Customer Service	1420	1500
Administration	XXX	XXX
Finance	XXX	XXX
Technical	XX	XX
Total	6,940	7,000

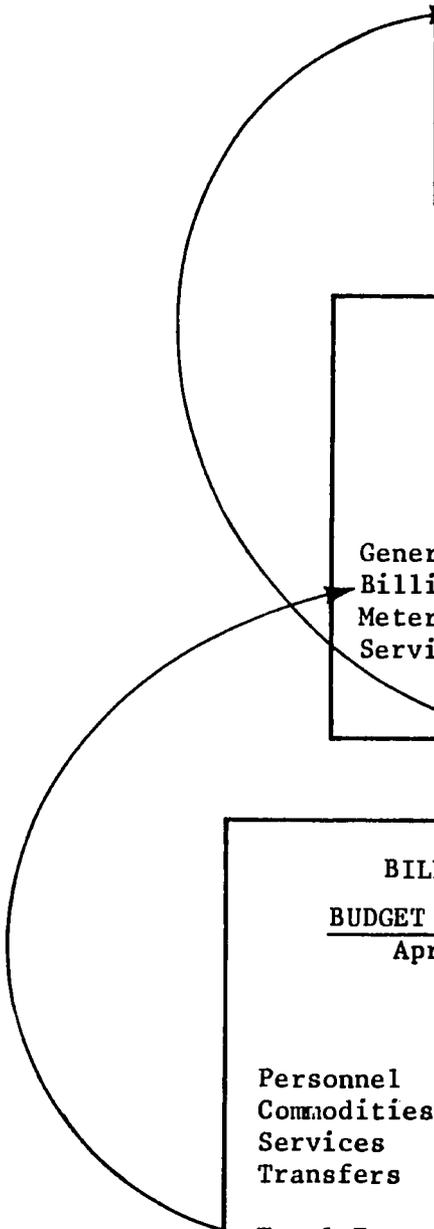
UTILITY SUMMARY

<u>CUSTOMER SERVICE</u>		
<u>BUDGET VERSUS ACTUAL</u>		
April 1980		
	<u>Budget</u>	<u>Actual</u>
General	XXX	XX
Billing	22	24
Meter Repair	XX	XX
Service Centers	XX	XX
Total	1420	1500

SUMMARY CENTER

BILLING CENTER		
<u>BUDGET VERSUS ACTUAL</u>		
April 1980		
	<u>Budget</u>	<u>Actual</u>
Personnel	XX	XX
Commodities	XX	XX
Services	XX	XX
Transfers	XX	XX
Total Expense	22	24

PRIMARY CENTER



PLANT REPORT -  
BUDGET VERSUS ACTUAL

PLANT NAME: \_\_\_\_\_

REPORT DATE: \_\_\_\_\_

PERIOD: \_\_\_\_\_

Operating Expenses	This Month			Year to Date		
	Budget	Actual	Percent Difference	Budget	Actual	Percent Difference
PERSONNEL						
Wages						
Overtime						
Incentives						
Benefits						
Other						
Subtotal						
COMMODITIES						
Alum						
Chlorine						
Nalco						
Other Chemicals						
Spare parts						
Diesel						
Solar						
Other Petroleum						
Electricity						
Other Utilities						
Other Commodities						
Total Commodities						
SERVICES						
Maintenance						
- Internal						
- External						
Other						
Total Services						
DEPRECIATION						
TOTAL EXPENSES						

BUDGET ITEMS TO BE LISTED ON  
BUDGET VERSUS ACTUAL MONTHLY REPORTS

	Main- tenance Report	Network Report	Booster Stations	Others
<u>PERSONNEL</u>				
Wages	X	X	X	X
Overtime	X	X	X	X
Incentives	X	X	X	X
Benefits	X	X	X	X
Other	X	X	X	X
Subtotal	X	X	X	X
<u>COMMODITIES</u>				
Chemicals	X	X	X	X
Diesel	X	X	X	
Solar	X	X	X	
Other Fuel	X	X	X	
Other Petroleum	X	X	X	
Electricity	X	X	X	
Other Utilities	X	X	X	X
Spare Parts	X	X	X	X
Electrical	X			X
Mechanical	X			
Civil	X			
Pipes < 10cm	X	X		
Pipes > 10cm	X	X		
Valves, Gate	X	X		
Other	X	X		
Office Supplies	X	X		X
Other Commodities	X	X		X
Subtotal	X	X	X	X
<u>SERVICES</u>				
Maintenance	X	X	X	X
Purchased	X	X	X	X
Transfer	X	X	X	X
Transportation	X	X	X	X
Other Services	X	X	X	X
Total Services	X	X	X	X
<b>TOTAL EXPENSES</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

X = Line to appear on the subject report.

CUSTOMER SERVICE CENTER REPORT  
- BUDGET VERSUS ACTUAL

SERVICE CENTER: \_\_\_\_\_

PERIOD: \_\_\_\_\_

REPORT DATE: \_\_\_\_\_

Revenues and Receipts	This Month			Year to Date		
	Budget	Actual	Percent Difference	Budget	Actual	Percent Difference
<b>BILLED REVENUES</b>						
Private Customers						
Large Customers						
Government						
Other Water						
Connections						
Other Revenue						
Total Revenues	_____	_____		_____	_____	
<b>CASH RECEIPTS</b>						
Private Customers						
Large Customers						
Government						
Other Water						
Connections						
Other Revenue						
Total Cash Receipts	_____	_____		_____	_____	

OPERATIONS CASH FLOW

PERIOD: \_\_\_\_\_

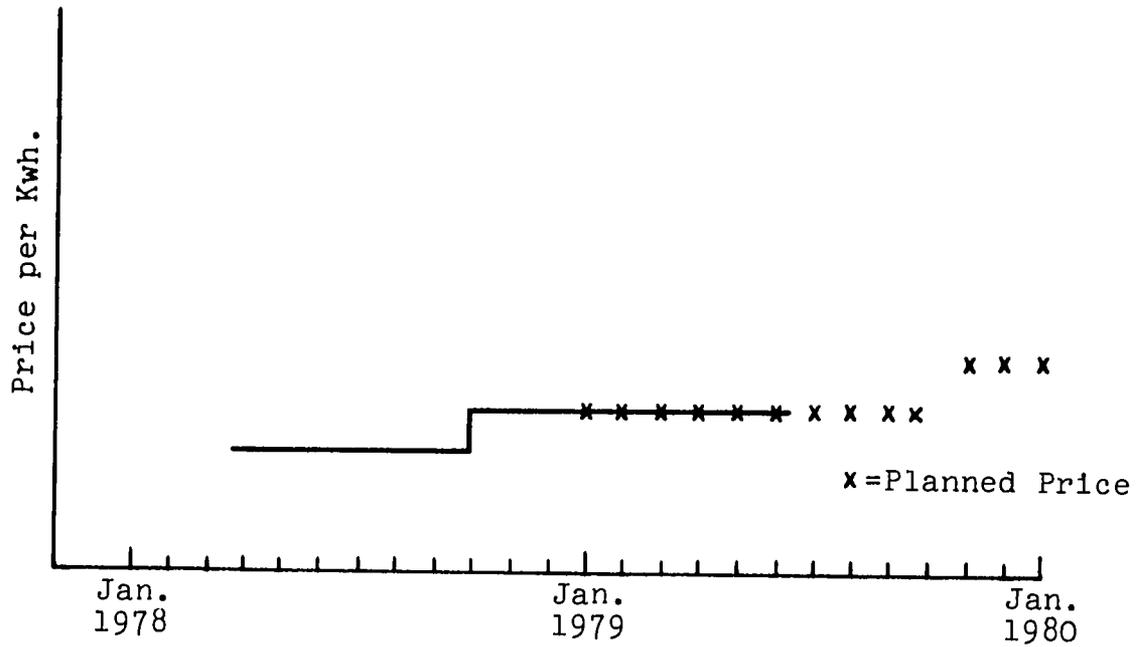
	Prior Month	Current Month	Next Three Months		
	LE	LE	LE	LE	LE
OPENING BALANCE					
<u>SOURCES OF CASH:</u>					
Collection of Receivables:					
Government					
Institutions					
All Others					
Operating Loans:					
State					
Other					
State Operating Subsidies					
Sale of Assets:					
Scrap					
Other					
Loans Repaid					
Interest					
Rents					
Other Sources					
<b>TOTAL SOURCES OF CASH</b>					
<u>CASH DISBURSEMENT:</u>					
Labor and Fringe Benefits					
Taxes					
Payment of Accounts:					
Inventory					
Expenses					
Letter of Credit (non-capital expenditures)					
Operating Loan Repayments					
Interest					
Rents and Leases					
Transfer to Capital Projects					
Transfer to Ministry of Finance					
Other					
<b>TOTAL DISBURSEMENTS</b>					
<b>CLOSING BALANCE</b>					

CAPITAL PROJECTS CASH FLOW  
- LOCAL CURRENCY

PERIOD \_\_\_\_\_

	Prior Month	Current Month	Next Three Months		
	LE	LE	LE	LE	LE
OPENING BALANCE					
<u>SOURCES OF CASH</u>					
Transfer from Operations					
Sale of Assets					
Capital Loans					
Foreign (LE)					
State					
Other Local					
Interest					
Contractor's Deposits					
Other					
TOTAL SOURCES OF CASH					
<u>CASH DISBURSEMENT</u>					
Labor and Fringe Benefits					
Taxes					
Import Duties					
Payment of Accounts					
Progress Payments					
Letters of Credit					
Purchase of Assets					
Other					
Interest During Construction					
Capital Loan Repayments					
Rents and Leases					
Other					
TOTAL DISBURSEMENTS					
CLOSING BALANCE					

ELECTRICITY PRICING REPORT



ANALYSIS OF CHANGE IN EXPENSE FROM LAST YEAR

<u>Cause of Change in Expense</u>	<u>Value of Change (LE)</u>	<u>Percent Change From Last Year</u>
Change in Volume <sup>(1)</sup>	XXXXX	XX.X%
Change in Price <sup>(2)</sup>	XXXXX	XX.X
Total Change	XXXXX	XX.X

Notes: (1) Value of change in volume =  
 (Volume this year - Volume last year)(Price last year)  
 (2) Value of change in price =  
 (This year's price - Last year's price)(Volume this year)

ACCUMULATION OF COST CENTER DATA<sup>(1)</sup>Production

<u>Code</u>	<u>Name</u>
53x2	Plant Operations
54x2	Plant Operations
55	Wellfields

Production Services

<u>Code</u>	<u>Name</u>
25,26	Stores
52	Facilities and Maintenance
53x15	Plant Maintenance
54x15	Plant Maintenance
59	Laboratories

Marketing

34	Customer Service
42	Customer Accounts
43	Meter Repair Shop
44,45	Service Centers
57,58	Pumping Stations
71	Distribution
71	Sewage Collection

Administration

11	Chairman's Office
12	Management Services
21	General Administration
22	Personnel
23	Administrative Services
24	Materials Management
31	General Finance
32	Data Processing
33	Financial Control
41	General Customer Service
51	General Operations
53x1	Plant Administration
54x1	Plant Administration
71	General Networks
91	General Technical
92	Project Management
93	Civil Engineering
94	Mechanical and Electrical Engineering

Note: (1) The four cost centers listed here are defined by the Egyptian Standard Accounting System.

RESPONSIBILITY FOR  
ACCOUNTING BOOKS

<u>Department</u>	<u>Books Maintained</u> <sup>(1)</sup>	<u>Type of Book</u> <sup>(2)</sup>
Central Accounts	General Journal	J
	General Ledger	J
	Miscellaneous Receipts by Responsibility Center	AB
	Miscellaneous Expenses by Responsibility Center	AB
Treasury	Cash Receipts	J
	Non-Cash Receipts	J
	Cash Payments Journal	J
	Bank Payments Journal	J
	Services Ledger	L
	Long-Term Loans	L
	Bidders Deposits	L
	Services by Responsibility Center	AB
Customer Accounts	Water Sales	J
	Sewer Use Fees	J
	Connections	J
	Customer Accounts	L
	- Water Sales <sup>(3)</sup>	L
	- Sewer Use <sup>(4)</sup>	L
	- Service Sales	L
	Water Sales and Collections by Service Center <sup>(3)</sup>	AB
Service Sales by Service Center	AB	
Past Due Bills	AB	
Payroll	Payroll	J
	Personnel Payroll Accounts	L
	Wages by Responsibility Center	AB
	Wages by Job Number	AB

- Notes: (1) See Appendix 6, Description of Accounting Books, for further detail.  
(2) J = Journal of Original Entry, L = Ledger  
AB = Analysis Book.  
(3) For water utilities only.  
(4) For sewer utilities only.

RESPONSIBILITY FOR  
ACCOUNTING BOOKS

<u>Department</u>	<u>Books Maintained</u> <sup>(1)</sup>	<u>Type of Book</u> <sup>(2)</sup>
Materials Control	Commodities Purchases	
	- Domestic	J
	- Foreign	J
	Commodities Usage	J
	Value of Inventory Items	L
	Inventories by Store	AB
	Commodities Usage by Responsibility Center	AB
	Commodities Usage by Job Number	AB
Asset Accounts	Capital Expenditures	J
	Asset Retirements	J
	Fixed Assets	L
	Fixed Assets Under Construction	L
Accounts Payable	Suppliers	L
Purchasing	Purchase Order Expenses	AB

Notes: (1) See Appendix 6, Description of Accounting Books, for further detail.

(2) J = Journal of Original Entry, L = Ledger  
AB = Analysis Book.

## 4.0 INFORMATION FOR PLANNING AND CONTROL

### 4.1 BACKGROUND AND OBJECTIVES

There are two basic elements to management, planning and controlling the work of others. Plans are made to define more clearly what the organization wants to do, and when, how and by whom it is to be done. Control is the process of ensuring that the plans are followed and goals are achieved. Control consists of three elements usually performed in sequence:

- Measurement of results. As work proceeds, results are quantified, measured and recorded.
- Comparison against plan. Actual and planned results are periodically compared. Important differences should be noted either for further investigation or for management action.
- Corrective action. Important differences are examined to determine:
  - . The nature and scope of the problem.
  - . The action to be taken to eliminate the problem.

The purpose of management information systems is to measure results, compare them against plan and present them to management in a useful form. These measures should:

- Provide information for planning.
- Permit a high level of financial control.
- Report the level of service provided to customers.
- Encourage efficient use of resources.

## 4.2 FINDINGS AND CONCLUSIONS

### 4.2.1 Information for Planning

Planning measures are required to:

- Determine future needs of the utility.
- Set goals for individual managers.

Very little planning information is developed by the utilities. A large amount of data is available concerning:

- Plant operations.
- Water quality.
- Customer billing and collections.

These data are summarized into annual reports. But these reports are:

- Too late.
- Not routinely given to managers and supervisors.
- Too detailed (still too much data).

Other vitally needed planning information is not gathered at all:

- Maintenance frequency and cost
- Manpower utilization
- New customer potential
- Cost data by department
- Measures of efficiency

Because so little planning information has been gathered:

- Present and future needs of the utilities have been poorly defined (as shown in Paragraphs 1.2.1, 2.2.1 and 2.2.2).
- Goals have not been set for managers and supervisors.

#### 4.2.2 Financial Control

Measures of financial performance serve three functions:

- They indicate the utility's overall financial health.
- They permit higher management to delegate spending authority without losing control.
- They encourage managers to think about cost.

Paragraphs 3.2.1 and 3.2.2 described the lack of financial controls within the utilities. This absence has contributed to the following problems:

- Few managers or supervisors are actively looking for methods of reducing costs.
- Management has severely limited the spending authority of subordinates. (For example, AWGA plant managers can spend a maximum of LE 20 on their own authority.)
- The cost per cubic meter of water has increased significantly at all utilities. (See Table 4.1 on the following page.)
- All of the utilities are incurring losses. (See Table 4.2 on the following page.)

#### 4.2.3 Customer Service

These measures:

- Indicate how well the utility is serving its customers.
- Remind managers of the ultimate goal of the utility.
- Discourage managers from cutting services in order to reduce costs.

TABLE 4.1  
COST OF OUTPUT

<u>Year</u>	<u>Cost per Cubic Meter of Water (Milliemes)</u>			
	<u>AWGA</u> <sup>(1)</sup>	<u>GOGCWS</u> <sup>(1)</sup>	<u>SCA</u> <sup>(1)</sup>	<u>GOSSD</u> <sup>(2)</sup>
1973	12.4	9.6	(3)	7.2
1974	12.5	10.4	(3)	7.2
1975	15.4	12.9	14.3	8.0
1976	18.4	14.8	44.0	9.5
1977	21.6	16.1	30.6	12.8
1978	20.4	20.7	N.A.	N.A.
1979	33.4	23.2	N.A.	N.A.

Notes: (1) Based on water produced and excluding imputed costs.  
 (2) Cost per cubic meter of sewage collected in Cairo.  
 (3) Insignificant operations.

Sources: Annual reports, 1978 budgets and interviews.

TABLE 4.2  
LOSSES BY UTILITIES

<u>Utility</u>	<u>LOSSES (LE 1,000)<sup>(1)</sup></u>	
	<u>1977- Actual</u>	<u>1978- Budget</u>
AWGA	1,048	(549) <sup>3</sup>
GOGCWS	3,703	5,497
SCA	1,354 <sup>(2)</sup>	N.A.
GOSSD	(4)	(4)

Notes: (1) Excludes imputed rent and interest.  
 (2) May not include all indirect expenses from SCA.  
 (3) AWGA budgeted a profit of LE 549,000. Actual results appear nearer to breakeven.  
 (4) GOSSD has no regular source of revenue but depends on a Government subsidy.

Sources: Annual reports for 1977 and budgets for 1978.

None of the utilities have reports that highlight the level of service provided to customers. Their absence communicates the idea that a high level of service is not one of the important goals of the utility.

Data are available on:

- Water quality.
- Water pressure.
- Leaks.

This data is not well summarized and, except for water quality, managers are given no goals to meet. Other types of data are not gathered:

- Delays in making connections (which often last a year)
- Areas not served
- Billing errors and delays
- Non-working meters (which may benefit the customers)

Service levels appear low in each of these areas.

#### 4.2.4 Efficiency

Measures of efficiency focus management attention on improving the utilization of resources.

Few such measures or reports were found. They are confined to:

- Laboratory reports
- Plant operating summaries
- Capital projects reports

These reports are deficient in that they:

- Provide no comparison with goals.
- Present no historical data.
- Are cluttered with detail.
- Are not properly distributed.
- Require no response.

In summary, they present today's data with little or no analysis.

The result of this lack of emphasis on efficiency is most clearly demonstrated by:

- Large numbers of people in plants and offices who appear to have little to do.
- Inoperative equipment in various plants.
- Inoperative controls in the plants.

#### 4.3 RECOMMENDATIONS

Information systems exist in two basic forms:

- Formal (regular, written reports transmitted to a standard list of people)
- Informal (verbal communications and irregular written communications)

The utilities in Egypt operate primarily through informal systems at present. Such systems may have served well when the utilities were much smaller. This Study recommends a shift to formal systems to meet the greater needs.

The formal system must be sufficiently comprehensive to meet the information needs of managers. Nevertheless, the costs of collecting, analyzing, and disseminating information must be balanced against the benefits. This cost restriction typically limits formal systems to information that is used on a regular basis. Special studies, other sources, or other measures should be used to obtain seldom used information.

For example, unserved household data are needed only when major revisions to the long-range plan are made. Census data may then be used or a special study made. For year-to-year planning, other measures such as new connections, quantity of water sold by area and distribution system pressure provide good estimates of new capacity requirements by area.

#### 4.3.1 Reports

New reports should be used to improve the decision-making of managers. These reports should monitor:

- Assumptions used in planning and budgeting.
- Financial performance.
- Customer Service.
- Operations efficiency.

Reports in each of these categories are recommended for each major function (See Exhibit 4.1). The following

information is provided for each report in Appendix 8:

- Purpose
- Scope
- Preparation responsibility
- Distribution
- Frequency
- Retention (how long and by whom)
- Data sources
- Sample format

Several principles were observed in designing these reports:

- Each report is intended to meet a definite need. Some of the reports indicate only one fact so that the user does not have to search out the use or meaning.
- The content of most reports includes three elements:
  - . The actual results for the most recent time period
  - . The expected results for the time period (budget or management target)
  - . Some indication of the trend in the value or the variable. Many reports are in graphical form for this reason.
- The needs of different levels of managers were considered. The Chairman's Daily Operations Report, for example, is a highly summarized version of the Daily Plant Report.
- Responsibility for preparing each report was clearly assigned to one person. He should not required higher level approval to prepare and distribute the report
- Only managers who regularly need to use the information are listed for distribution of each report. Others can ask for single copies when required.

- Most reports should be prepared monthly. Few daily reports are recommended because decisions requiring such frequent information can seldom wait for a report to be prepared. Few quarterly reports are recommended because they are often too late to permit the manager to take corrective action.
- In general reports are to be retained by the person who prepares them. There is no need for a data bank.

#### 4.3.2 Report Maintenance

Most reports eventually become out-of-date. Therefore, each report should be audited by the Management Services Department at least once every two years to determine its:

- Usefulness.
- Accuracy.
- Proper distribution.

#### 4.3.3 Use of Reports

Reports that are produced and merely filed are a waste of time. They must be used. The utilities should follow three rules to ensure good use of the reports:

- Distribute the reports to the right people.
- Require prompt response.
- Evaluate managers' performance on the basis of these reports.

4.3.3.1 Distribution. In general, reports should be distributed to the following people:

- The manager of the department whose performance is being measured
- The department manager's superior
- Managers of any other departments that might be affected by the results reported

Initial distribution of the recommended reports has been specified in Appendix 8. The utilities should review the distribution after each report has been in use for six months to determine which names should be added to or deleted from the list. The Management Services Department should be responsible for this review.

4.3.3.2 Response. Prompt and serious response to the reports is essential. Top management can ensure response by regularly asking managers questions based on the reports.

Written responses should be prepared for the reports listed in Table 4.3 when significant variations occur between actual and planned results. The response should explain why the variation has occurred and describe a plan to remedy the situation. The response should be prepared within ten days of receipt of the report and should be directed to the vice chairman of the responsible area. In some cases, an additional copy should be prepared for other managers.

TABLE 4.3  
REPORTS REQUIRING A WRITTEN RESPONSE

<u>Title</u>	<u>Response Prepared By:</u>
Budget vs. Actual Statement	Responsibility Center Manager
Monthly Laboratory Analysis	Plant Manager
Monthly Plant Report	Plant Manager
Monthly Treatment Report	Plant Manager
Hours of Non-Functioning Class A Equipment	Plant Manager
Accounts Receivable	Customer Service Center Managers
Top Management Project Summary	Project Manager

The planning assumptions should be reviewed by the Management Services Department as well as by affected department heads. The Management Services Department should:

- Recognize when plans should be changed.
- Prepare a written proposal for change when required.
- Submit the proposal to the Management Committee for review, revisions and approval.

4.3.3.3 Evaluation. The answers to the following questions should be considered during each manager's annual performance review:

- How closely did he meet the goals in his department plan?
- How effective were the actions he took when results deviated from plan?

These questions should be discussed with the manager at the time of his annual review and again when new plans and goals are set.

#### 4.3.4 Management Indicators

The process of setting goals, measuring results and holding managers responsible should begin at the top. Each year the Board of Directors should establish goals for top management.

Each month the Management Committee should review the reports listed in Exhibit 4.2 to determine:

- Which, if any, of the Boards goals are not being met.
- Whether plans should be changed.
- What information and recommendations should be submitted to the Board of Directors.

The Board should evaluate top management on the basis of performance against these goals at the end of the year.

#### 4.3.5 Implementation

The Management Services Department in each utility should be responsible for overseeing the implementation of these reports. Nevertheless, the managers responsible for preparing and using them must make the final decisions on format and timing. During the first six months a copy of each report should routinely be investigated. During the review recommended at the end of six months, the Management Services Department should decide whether it wishes to continue to receive the report.

RECOMMENDED MANAGEMENT REPORTS

<u>Responsibility for Report Production</u>	<u>Name of Report</u>	<u>Type of Report</u> (1)	<u>Frequency</u>	<u>Type of Utility</u> (2)	<u>Exhibit Number</u>
<b><u>OPERATIONS</u></b>					
Operations Statistics	Daily Operations Report	C	Daily	W	A8.1
	Monthly Production Report	P	Monthly	W	A8.2
	Monthly Treatment Report	P	Monthly	S	A8.3
	Materials and Energy Efficiency Report	E,P	Monthly	S,W	A8.4
	Hours of Non-Functioning Class A Equipment	E,P	Monthly	S,W	A8.5
	Monthly Booster Station Analysis	E,P	Monthly	S,W	A8.6
	Monthly Wellfield Report	E,P	Monthly	S,W	A8.7
Plants	Daily Plant Report	C	Daily	S,W	A8.8
	Plant Manager's Daily Summary	E,C	Daily	W	A8.9
	Daily Booster Station Report	E,C	Daily	S,W	A8.10
	Daily Water Laboratory Report	E,C	Daily	W	A8.11
	Monthly Laboratory Analysis	E,P	Monthly	W	A8.12
	Monthly Plant Report - Sewage	E,P	Monthly	S	A8.13
	Monthly Plant Maintenance Report	E,P	Monthly	S,W	A8.14
	Overhaul Schedule	P	Annual	S,W	A8.15
Shops	Fleet Use	E	Monthly	S,W	A8.16
Networks	Monthly Branch Report	E,C	Monthly	S,W	A8.17
Laboratories	Distribution System Water Quality	C	Monthly	W	A8.18

Notes: (1) C = Customer Service      E = Efficiency      F = Financial      P = Planning  
 (2) S = Applicable to a sewerage utility,      W = Applicable to a water utility

RECOMMENDED MANAGEMENT REPORTS

<u>Responsibility for Report Production</u>	<u>Name of Report</u>	<u>Type of Report<sup>(1)</sup></u>	<u>Frequency</u>	<u>Type of Utility<sup>(2)</sup></u>	<u>Exhibit Number</u>
<u>TECHNICAL</u>					
	Project Task Analysis	F,P	Monthly	S,W	A8.19,2.4
	Monthly Status Report - Technical Sector	E,P	Monthly	S,W	A8.20
<u>CUSTOMER SERVICE</u>					
Headquarters	Customer Service Summary Report	E,P,C	Monthly	W	A8.21
	Service Center Comparison Report	E,C	Monthly	W	A8.22
	Accounts Receivable	E	Monthly	W	A8.23
Service Centers	Service Center Monthly Report	C,E,F	Monthly	W	A8.24
<u>MATERIALS MANAGEMENT</u>					
	Materials Management Monthly Report	E,F	Monthly	S,W	A8.25
	Critical Stockouts	E	Monthly	S,W	A8.26
<u>PERSONNEL</u>					
	Personnel Monthly Report	E	Monthly	S,W	A8.27
	Number of Personnel by Responsibility Center	E	Monthly	S,W	A8.28
	Safety Report	E	Monthly	S,W	A8.29

Notes: (1) C = Customer Service      E = Efficiency      F = Financial      P = Planning  
 (2) S = Applicable to a sewerage utility,      W = Applicable to a water utility

RECOMMENDED MANAGEMENT REPORTS

<u>Responsibility for Report Production</u>	<u>Name of Report</u>	<u>Type of Report<sup>(1)</sup></u>	<u>Frequency</u>	<u>Type of Utility<sup>(2)</sup></u>	<u>Exhibit Number</u>
<u>FINANCE</u>					
	Operations Cash Flow	F,P	Monthly	S,W	A8.30
	Capital Projects Cash Flow - Local Currency	F,P	Monthly	S,W	A8.31
	Financial Statements	F,P	Monthly	S,W	A8.32
	Top Management Project Summary	E,P	Monthly	S,W	A8.33
	Budget Versus Actual Expenses	E,F,P	Monthly	S,W	A8.34
	Budget Versus Actual Revenues and Receipts	E,F,P	Monthly	S,W	A8.35
	Job Accounting Report	E,F,P	Monthly	S,W	A8.36
	Pricing Reports	P	Occasional	S,W	3.10
	Data Processing Monthly Report	E	Monthly	S,W	A8.37
<u>MANAGEMENT SERVICES</u>					
	Cost Versus Revenues per 1000M <sup>3</sup> of Average Daily Production	P	Quarterly	S,W	A8.38
	Water Billed + Water Produced	E	Monthly	S,W	A8.39
	Board of Directors Annual Report	F,P	Annually	S,W	A8.40
	Per Capita Demand	P	Annually	S,W	A8.41
<u>ALL RESPONSIBILITY CENTERS</u>					
	Manpower Utilization	E	Monthly	S,W	A8.42

Notes: (1) C = Customer Service      E = Efficiency      F = Financial      P = Planning  
 (2) S = Applicable to a sewerage utility, W = Applicable to a water utility

MANAGEMENT INDICATOR REPORTS

<u>Title</u>	<u>Type of Utility(1)</u>
Monthly Production Report	W
Monthly Treatment Report	S
Hours of Non-Functioning Class A Equipment	S,W
Fleet Use	S, W
Monthly Branch Report (1st page)	S, W
Distribution System Water Quality	W
Monthly Status Report - Technical Sector (Summary Section only)	S, W
Customer Service Summary	W
Materials Management Monthly Report	S, W
Personnel Monthly Report	S, W
Safety Report	S, W
Financial Statements	S, W
Budget Versus Actual Expenses	S, W
Budget Versus Actual Revenues and Receipts	S, W
Water Billed ÷ Water Produced	W
Per Capita Demand	S, W

Note: (1) S = Applicable to a sewerage utility,  
W = Applicable to a water utility.