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MANAGEMENT DIAGNOSTIC REVIEW

OF

ALEXANDRIA GENERAL ORGANIZATION FOR SANITARY DRAINAGE

APRIL 1981

(FINAL)

ARTHUR YOUNG

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EXECUTIVE SUMMARY

This summary provides an overview of the results of the management analysis of the Alexandria General Organization for Sanitary Drainage (AGOSD) performed by Arthur Young and Company in association with Boyle Engineering Corporation. We have measured AGOSD against criteria that even mature organizations would find difficult to meet. AGOSD is a new and developing organization that has been faced with an overloaded and rapidly deteriorating sewerage system and has not been granted the luxury of time to adequately address all its needs.

The reader is encouraged to refer to the full report for a discussion of the objectives and scope of the review and for details supporting the following findings and conclusions.

A. SUMMARY OF FINDINGS

Our overall finding is that AGOSD has not yet developed clearly defined objectives and policies, organizational stability, and management control systems. The organization is not strong in terms of documented systems and procedures, or in the use of reports and information to control operations. Most existing procedures are government regulations that merely state "what should be done", but fail to provide sufficient guidance as to "how" it should be done.

AGOSD still lacks the tools and equipment it currently needs but in general has more personnel than can be effectively utilized. There is a need to re-allocate its resources, and to acquire and maintain adequate tools and equipment to effectively support the expansion plans.

By most standards of measurement, AGOSD has a long and difficult road to be traveled to eventually manage a modern wastewater facility effectively.

ORGANIZATION

Organization Structure

"The instability of the organization confuses lines of communication, complicates the clear definition of responsibilities and the delegation of authority".

"The Chairman currently has nine staff positions and the managers of three major departments reporting to him. The span of control required for these vital and diverse technical and operational areas, is beyond the limits desirable for effective control. These responsibilities limit the time available to the Chairman for the future planning of AGOSD's organization and operations and his role as AGOSD chief spokesman".

"The fragmentation of similar activities all concerned with a common function such as personnel planning and management, limits the development of cohesive policies and programs. This situation also creates the potential for overlapping responsibilities and a duplication of efforts. It also contributes to bureaucratic red tape and confusion for the employees".

Delegation of Authority

"The mission statements as well as the individual manager's position descriptions do not contain delineations of responsibilities nor definitions of the specific authorities granted. The delegation of authority, therefore is inconsistent, and subject to frequent changes resulting in confusion and a lack of a consistent direction of the organization".

"Authority within AGOSD is highly centralized and rests mainly with the Chairman with selective delegation to a few members of the top management group".

The Chain of Command

"The defined reporting relationships, chain of command, contained in the formal organization plan are routinely violated. The result is that individual managers' authority is being eroded, their work schedules interrupted, and their plans diverted".

Management Style

"There is a tendency within AGOSD to create committees and to use meetings as a vehicle for decision making and spreading responsibility".

"The role and authority granted to the various committees is unclear. Their existence tends to remove authority and responsibility from individual managers, and delay the decision-making process".

"The committee or meeting style of management at AGOSD is an attempt at "management by consensus and a means of sharing the responsibilities for decisions. Further they are tending to exclude middle managers and supervisors who are near the "scene of action" and who are able to provide first hand knowledge. This creates the potential for reaching decisions without all the facts available".

The Organization Profile

"A profile of the job grades within AGOSD tends to verify the perceptions gained during the review that there is a need for more supervisory and first line management".

MANAGEMENT, SUPERVISION AND EMPLOYEE TRAINING

Current Policies and Programs

"Training and management development to date have received a low priority within AGOSD. For the fiscal year 1980-81 .025% of the total budget was allocated to this area".

"Managements' perception of training and development tends toward the more technical areas of engineering or wastewater treatment and less toward management, supervisory or employee training in non-technical areas".

"There have been no training or management development programs conducted to date, although there have been some assignments of personnel to work with foreign contractors with the hope and expectation that they would absorb some technical and managerial know-how from this association".

Employee Training Needs

"Most employees learn their jobs by observing others perform them and not by following prescribed procedures. Consequently, there is no objective basis for determining the requirements for training, the procedures to help train new employees, or the standards to be used to measure their job performance".

"Throughout the AGOSD organization, less than half the employees appear to be working. This is due to a combination of overstaffing, not knowing what to do, and lack of incentive or pressure for supervisors to improve productivity".

"The lack of standard procedures not only effects the stability of the duties of employees but makes the assessment of specific training needs difficult".

"There are currently no incentives for supervisors to improve operations or for the employees to learn their job or to acquire the skills required to work effectively".

Management and Supervisory Development

"Management and supervision throughout AGOSD are not adequately prepared either educationally or by previous practical experience for their positions as managers or supervisors".

"There is a serious need to provide incentives for management to improve operations, and for management to replace subordinates who do not perform".

"The criteria for promotion are vague and do not contain job performance evaluations. The experience requirements for most management positions, as expressed in the job description, are equally vague and do not specify the levels of previous managerial or supervisory experience required".

"The training of managers and supervisors must range from basic supervisory and human relations skills to the broader subjects of management and control".

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MANAGEMENT INFORMATION AND CONTROL

Current Management Reports

The following are general characteristics of the current management information and reporting systems at AGOSD:

- * Most organizational units within AGOSD neither receive nor prepare any regular management report.
- * Information is not readily available in a form that is useful for management, resulting in the need for frequent special studies to gather information.
- * Management information is primarily exchanged verbally during a series of semi-regular meetings.
- * Most formal reports are required by other government agencies (i.e, Ministry of Finance) and thus meet the information needs of those agencies and not of AGOSD.
- * Because certain reports are required by the government, the majority of AGOSD officials believe they are prohibited from creating additional related internal reports that would provide more useful information for the control operations.
- * Regular management reports are not used in AGOSD because middle management tends to believe that top management might:
 - not fully understand the situation
 - be uninterested
 - be too busy to read the reports

"Management reports currently in use within AGOSD are primarily associated with the finance and construction management functions. The infrequency of other reports limits their utility in management information and control".

"No member of the top management of AGOSD or even the key finance officials receive any regular report of the financial status of the organization".

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"Two important managers working within the same functional area are not familiar with what each is doing or is responsible for".

"Regular management reports are submitted either because a government regulation requires them or because a particular manager requests them and only a few of these reports provide useful management information".

"Considering the lack of telecommunications, the effect of reliance on verbal communications is to occupy a significant portion of the management's time attending meetings and gathering information. This leaves little time for the actual management function".

"A good management reporting system must be perceived as important and useful by those who prepare the reports. This perception can only be imparted by a management who responds to the report contents".

Organization and Maintenance of Management Information

"AGOSD has not defined its information requirements nor has it designed the appropriate forms for the provision of such information".

"A large part of the effort involved in preparing management reports is involved in a perpetual laying out of standardized report forms that should be pre-printed".

"Storage of important management information is unorganized and inefficient making it difficult to locate key documents when they are needed".

"The same information is often maintained in two or more registers located in various areas of AGOSD. This duplication is an inefficient use of manpower (two or more people doing the same job) and confirms the previous finding that AGOSD has not defined its information and information storage requirements".

"During non-working hours anyone who walks into AGOSD has access to look at and/or steal many financial or personnel records".

"Only one person at a time can work with key registers resulting in delayed access to important information and an inefficient use of manpower if two or more people need access to the same register at the same time".

SYSTEMS AND PROCEDURES

Current Systems

"The fact that the current systems have never been formalized results in the inconsistent application of procedures leading to an inefficient and untimely fulfillment of goals".

It is possible to make several observations that apply to all systems currently in use at AGOSD.

- * Most areas do not have defined goals and objectives and as a result their systems are not based upon specific goals.
- * Procedures are not documented and specific responsibilities are not assigned to specific individuals.
- * The integration of system components has generally not been defined resulting in overlapping responsibilities and duplication of effort.
- * Formalities of inter-departmental communications obstruct the smooth and efficient flow of documents within systems.
- * Lack of adequate support equipment decreases the efficiency of specific systems. For example the Bookkeeping Section has one calculator for sixteen employees.

"The informal systems in use at AGOSD are usually personal adaptations of old GOSSD systems or government regulations to which most employees have no access"

"The executive level offices have confused or undefined goals and objectives and because of this they are unable to develop standard systems and procedures".

"The effect of government regulations and the fragmented, undefined responsibilities have limited the effectiveness and flexibility of the personnel administration systems".

"AGOSD's total reliance on generalized government regulations, to the exclusion of other potentially beneficial systems, has resulted in an inefficient application of resources and a lack of control over their use".

"The financial systems in use at AGOSD, dedicated to providing information to the Ministry of Finance and other government departments, do not provide the financial information and control necessary to manage a large organization effectively.

"There are no formal or informal procedures for the operation of the treatment plants".

"The same functions are performed in four districts in four different ways because no formal integrated systems have been developed for operations and maintenance".

"Within AGOSD the closest thing to a formal system is that found in the Vehicles Department. However, it is unable to function efficiently or effectively because of a lack of resources and the interference of top management".

PLANNING AND BUDGETING

Plan Development

"The existence of two separate plans, the TPP projects of the Master Plan and the AGOSD plans not only complicates management control but greatly increases the ineffective use of AGOSD resources".

Coordination of Plans

"The procedures for coordinating the Annual Construction Plan with the Master Plan are not clearly defined or documented to the degree necessary to ensure that there are no conflicts between plans".

"The criteria for selecting projects to be included in the AGOSD Annual Plan are not documented and we were not able to determine how one project is selected over another".

"The planning and execution of new construction projects while the Master Plan is being revised could result in the ineffective use of human and financial resources regardless of the amount of coordination".

"The planning of manpower, essential support equipment, and systems is not based on a realistic assessment of needs, current conditions or the expansion of new facilities".

"The lack of integrated planning with assumptions as to levels of activities and future needs, could seriously impact the ability of AGOSD's management to effectively operate a modern wastewater collection and treatment system".

Control of the Planning Process

"The plan development at AGOSD is fragmented in several organizational units and is a part-time or extra duty added to managers who already have significant work loads".

"The lack of a full-time, high level manager for planning is limiting the scope of planning primarily to facilities and causing the inconsistencies of the planning done in Operations and other support departments within AGOSD".

"The lack of a controlled planning system, and the lack of communication of common assumptions and goals can result in an ineffective use and allocation of resources. The addition of employees at the magnitude planned would represent such an ineffective use of resources".

Assessment of Needs and Budgeting

"There is no re-evaluation of past programs and current needs or consideration of current efficiency levels. Consequently, past inefficiencies are carried over into the new budgets and budget levels may not reflect AGOSD's present or immediate future needs".

"The budget is not divided by the organizational units within AGOSD, (responsibility centers) consequently, managers cannot be held financially responsible for their operations or decisions".

"The current situation is conducive to "empire building" and managers are motivated to enlarge their staffs simply because this increases the status of their own positions".

"Government regulations or laws are used as an excuse for not exercising control. These regulations once complied with, do not prevent AGOSD from developing cost or responsibility centers and using the budget as an internal management control".

CONSTRUCTION MANAGEMENT

Project Design

"The Design Department is too small and is deficient in appropriate engineering disciplines, equipment and adequate work space to perform the normal mission required of a Design Department"

Contracting Procedures

"The unit price method of tendering contracts can lead to subjective evaluations in making construction contract awards

"Detailed and standardized procedures, as well as documented criteria for evaluating tenders, have not been developed

"Uniform, standard contract procedures should be used in negotiating and preparing construction contract change orders".

Project Management

"The management of construction projects is fragmented among several organizational units. This situation confuses the chain of command and complicates the development of unified policies, procedures and the developmental training of field engineers".

"There is not a unified AGOSD voice giving instructions to contractor personnel and often the contractors receive contradictory instructions".

"Assigning young engineers to resident construction sites to gain experience is a well founded practice to enhance engineering development".

"The resident site staff requires detailed, uniform procedures to follow in the performance of their duties. These procedures should give the resident engineer the authority and responsibility to execute minor change orders".

"One contractor's employment of a US/Egyptian Joint Venture Project Management Consultant is proving very beneficial in the timely execution of one construction project".

B. SUMMARY OF CONCLUSIONS

The conclusions reached as a result of this review will require that implementation projects be developed to effect major changes in the organizational structure, policies, procedures and systems, planning and budgeting and in construction management. Additionally, programs in management development supervisory training are also necessary.

The implementation of changes and the development of new management programs should be implemented in a way and at a pace which allows the people within AGOSD to understand and adjust to a particular change before proceeding to the next project.

We have measured AGOSD against very demanding criteria and we fully recognize that there are conclusions and suggestions of need that may require years to attain. However, we are confident that with the resolve and commitment of the top management of AGOSD, significant improvements are possible. It should be noted that lasting improvements will not possible without the active support and participation of the top management of AGOSD.

Whether the ultimate objective in any area is achieved is not important, only that progress is made in areas which improve the utilization of the resources available.

We have grouped our conclusions, by area and indicated our sense of their priorities. These conclusions should be evaluated by the management of AGOSD, who should form their own priorities.

Once this has been accomplished, projects and implementation plans can be developed for those projects deemed most important to the effective management of AGOSD.

ORGANIZATION

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|--|-----------------|------------------|
| 1. Develop a plan for modifying the current structure, and for developing specific missions and objectives for AGOSD and each departmental unit. | High | 10 |
| 2. Evaluate and test organizational alternatives. | High | 11 |
| 3. Add critical functions to current organizational structure. | High | 11 |
| 4. Develop specific position descriptions for management | Medium | 12 |
| 5. Develop an AGOSD management policy manual. | Medium | 12 |

MANAGEMENT, SUPERVISION AND EMPLOYEE TRAINING

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|---|-----------------|------------------|
| 1. Establish a major staff position for management development. | Medium | 20 |
| 2. Use the process of implementing changes recommended herein as a training vehicle. | High | 21 |
| 3. Develop an AGOSD engineering and management library. | Medium | 22 |
| 4. Assess the AGOSD managerial and supervisory training needs. | Medium | 22 |
| 5. Develop a program of incentives to encourage management, supervisory and employees training. | Medium | 22 |
| 6. Evaluate supervisors on the productivity of their departments | Low | 23 |

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|---|-----------------|------------------|
| 7. Acquire audio visual training equipment. | Low | 23 |
| 8. Revise employee evaluation criteria. | Medium | 23 |
| 9. Develop training programs. | High | 23 |

MANAGEMENT INFORMATION AND CONTROL

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|---|-----------------|------------------|
| 1. Define what management information is required and how it can be efficiently supplied. | High | 35 |
| 2. Develop an AGOSD management style oriented toward the use of regular reports. | Medium | 36 |
| 3. Provide sufficient storage facilities to organize and maintain management information efficiently. | Medium | 36 |

SYSTEMS AND PROCEDURES

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|--|-----------------|------------------|
| 1. Identify key management functions. | High | 49 |
| 2. Review AGOSD's systems requirements and design appropriate systems. | Medium | 49 |
| 3. Apply systems and procedures consistently once established. | Medium | 50 |

PLANNING AND BUDGETING

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|--|-----------------|------------------|
| 1. Consolidate the two major facilities plans. | High | 58 |

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| | | |
|--|--------|----|
| 2. Establish a central planning department. | High | 59 |
| 3. Develop an integrated planning system. | High | 60 |
| 4. Develop planning guidelines for each organizational unit. | Medium | 60 |
| 5. Develop an AGOSD planning manual. | Medium | 61 |
| 6. Develop an annual expense and manpower budget for each organizational unit (cost center). | Medium | 61 |
| 7. Assess budget requirements based on current levels of activity and volumes of work. | Medium | 62 |
| 8. Evaluate supervisors on the basis of their performance to budget. | Low | 62 |

CONSTRUCTION PROJECT MANAGEMENT

| <u>CONCLUSIONS</u> | <u>PRIORITY</u> | <u>PAGE REF.</u> |
|--|-----------------|------------------|
| 1. Improve all aspects of engineering design. | High | 69 |
| 2. Develop standards and procedures for the tender review process. | Medium | 69 |
| 3. Evaluate the use of fixed price contracts. | Low | 69 |
| 4. Establish the role of one single construction project manager. | High | 70 |
| 5. Provide decision making authority at the resident engineer level. | Medium | 70 |
| 6. Establish and implement uniform change order procedures | High | 70 |
| 7. Develop site engineering policies and procedures. | Medium | 70 |

I. INTRODUCTION

This report presents the results of the management diagnostic review as required in Phase I of the agreement between the Alexandria General Organization for Sanitary Drainage (AGOSD) and Boyle Engineering Corporation and Arthur Young & Company.

The report deals with the organization and management of AGOSD and contains substantive findings regarding the organization, management and supervisory development, management information and control, internal systems and procedures, and the planning and control of construction projects.

A. OBJECTIVES AND SCOPE

Our approach to the review of the management of AGOSD was developed to meet these general objectives:

- * To evaluate the effectiveness of the overall organization and management of AGOSD as well as each of the major functional units.
- * To evaluate the basic systems and reports utilized throughout the organization to determine if they meet normally expected standards of efficiency and control.
- * To review the present utilization of the human, equipment and financial resources used or expended by management in conducting the day to day operations to determine if they are being effectively utilized.

B. ACKNOWLEDGEMENTS

Throughout this review, we received good cooperation from the management, engineers, and employees of AGOSD. We appreciate their candor and willingness to share their ideas, discuss problems and to supply us with manuals, documents and other information we required.

We also had the benefit of prior studies such as the "Management and Tariff Studies Relative to Water/Sewerage Systems", prepared for the Ministry of Development and New Communities.

These studies were helpful to us in providing background information and in many instances a verification of our perceptions, findings and conclusions.

C. ORGANIZATION OF THE REPORT

As indicated, this report documents significant findings and conclusions from our review of the management of AGOSD.

We have organized the report in nine sections, containing our findings, and conclusions. The intent of this report is to present succinctly all the results of our review and to provide the basis for defining improvement projects to be accomplished during the next phases of the project.

II. ORGANIZATION

Prior to 1979, the Alexandria sewage system was managed by the General Organization for Sewerage and Sanitary Drainage, (GOSSD) a division of the Ministry of Housing. In August of 1979 the Alexandria General Organization for Sanitary Drainage (AGOSD) was created as a separate organization charged with the planning and management of the Alexandria sewer system.

The separation of AGOSD from GOSSD apparently bore all the agonies of surgical intervention in the competition for management, staff, laborers and other resources. During the separation, AGOSD was assisted by the Central Agency for Organization and Administration in developing an organizational structure, position descriptions and the general responsibilities of the sub-organization units.

The development of a new organization while assuming the responsibilities for a rapidly deteriorating and overloaded sewer system has not been an easy task and has impacted the decision making process, the delegation of authority and the development of a sound chain of command.

We have viewed AGOSD as a new developing organization, which has not been granted the luxury of time to stabilize relationships and fully implement the original organizational design. The reader should bear this in mind in evaluating the findings and conclusions which follow.

A. APPROACH

Our approach to evaluating AGOSD's organization was to review the current organization chart, statements of missions,

position descriptions and to supplement this documentation with a series of indepth interviews with all the key members of management. From these interviews we were able to develop an understanding of the "decision making process", the delegation of authority, and the lines of communication throughout the organization.

Our objectives were to determine how well the organizational structure provides the avenues of communication and its general effectiveness as a framework for AGOSD's management to exercise the control necessary to achieve its mission, conserve its assets and effectively utilize its resources.

B. FINDINGS

1. Organization Structure

The original organization plan is currently still being implemented. There are functions defined in the plan and on the organization chart which are not staffed. These include such staff functions as Financial and Administrative Inspection, Planning and Follow-up.

Several key management positions are being filled by people on loan from other government organizations. The General Manager of Administration and Financial Affairs, the Manager of Finance, and the Manager of Administration are in this category. Not only is the General Manager of Administration and Financial Affairs on loan, but he is listed as also filling the staff position of Organization and Administration, and yet he has limited availability because he is a member of the Peoples Assembly of Egypt.

The Manager of Treatment is also acting as head of the Technical Office for Experience and Communication, a staff position and co-Manager of the Execution Department, a line position. Additionally, the key position of General Manager of Operations and Maintenance is filled by a former employee, now in a consulting capacity.

Finding

The instability of the organization confuses lines of communication, complicates the clear definition of responsibilities and the delegation of authority.

The result is that the direction and planning of vital functions is adversely affected, as is the morale and motivation of middle management in those functions.

Since the development of the organization plan, several major adjustments have been made. The treatment plants and the Vehicle Department have been placed under the control of the General Manager of Technical Affairs and removed from the Operations and Maintenance Department.

Finding

Although this adjustment could be viewed as a temporary measure, it is further overloading a key executive, the Manager of Technical Affairs, during a critical period for AGOSD. Without a future organizational plan communicated to the organization, it is further eroding the organizational structure and contributing to its instability.

The current organization has nine staff positions as well as three "line" managers of the major functions of Administration and Financial Affairs, Technical Affairs, and Operations and Maintenance reporting directly to the Chairman of the Board.

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Finding

The span of control required for these vital and diverse technical and operational areas, is beyond the limits desirable for effective control. These responsibilities limit the time available to the Chairman for future planning of AGOSD's organization and operations and his role of chief spokesman for AGOSD.

Similar and related activities which require management with the same background and technical experience are fragmented within the current organizational structure. For example:

- * Personnel attendance monitoring is the responsibility of Public Relations.
- * Personnel complaints are handled by Legal Affairs, the Personnel Section, and Public Relations.
- * Manpower planning is divided among the Personnel Section, Organization and Administration, a staff function and the Personnel Committee.
- * Wages, employment and the personnel files are the responsibility of the Personnel Section, within Administration and Financial Affairs.

Finding

The fragmentation of similar activities all concerned with a common function such as personnel planning and management, limits the development of cohesive policies and programs. This situation also creates the potential for overlapping responsibilities and a duplication of efforts. It also contributes to bureaucratic red tape and confusion for the employees.

2. Delegation of Authority

The missions and responsibilities of the organizational units within AGOSD, as presented in the documentation that we reviewed, are general and rather vague statements of responsibilities. The positions descriptions for the key positions were similarly stated in general terms.

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Finding

The mission statements as well as the individual managers position descriptions do not contain delineations of responsibilities nor definitions of the specific authorities granted. The delegation of authority, therefore is inconsistent, and subject to frequent changes resulting in confusion and a lack of a consistent direction of the organization.

Statements of each organization's mission and clearly defined limits of authority are not the total answer to the delegation of authority, but they are a base from which understandings and effective working relationships can be formed.

During the review, we observed the most minor decisions being referred to the Chairman of the Board. Some of these included the approval of the vacations for employees at all levels, the purchase of many items, employee terminations, and the review of contractor's invoices. Other members of "top" management were involved in similar details.

Finding

Authority within AGOSD is highly centralized and rests mainly with the Chairman with selective delegation to a few members of the top management group.

The lack of delegation of authority may be due to a number of reasons, however, the result is that the top management of AGOSD is bogged down in details which are often of little importance in achieving the larger mission of modernizing the Alexandria sewer systems.

3. The Chain of Command

During the review, we observed many instances of top managers by-passing middle level managers and supervisors to issue instructions directly to employees. The top management

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group and others are dealing directly with managers, and employees throughout the organization, and crossing defined organizational lines.

Finding

The defined reporting relationships, chain of command, contained in the formal organization plan is routinely violated. The result is that individual managers' authority is being eroded, their work schedules interrupted, and their plans diverted.

The lack of routinely produced management information or the genuine desire of management to respond to needs are perhaps the motivation for the current management style illustrated herein. However, the impact is a long term erosion of the formal organization structure and a continuation of a crisis atmosphere.

4. Management Style

Most organizations seem to adopt a style or character and this often reflects the way the organization actually works and the way decisions are made.

Within AGOSD, there is a tendency to create committees and to use meetings as a vehicle for decision-making. During the review we noted there is a Technical Review Committee, an Industrial Safety Committee, a Foreign Contractors Committee, Internal Construction Committee, Personnel Committee, Personnel Incentive Committee, as well as others established for specific and often short term purposes.

Finding

The role and authority granted to the various committees is unclear. Their existence tends to remove authority and responsibility from individual managers, and delay the decision-making process.

Committees are necessary in most organizations and can serve as an effective means of communication and exchanging ideas, provided their functions and roles are defined and specific objectives are established. Typically committees can serve useful roles as bodies that establish procedures, standards, such as engineering standards or drafting standards, and give advice and guidance. They generally are a very cumbersome and time consuming means of reaching decisions. Within AGOSD, they are tending to function as decision-making bodies with committee members each signing the agreements and decisions that are made.

Finding

The committee or meeting style of management at AGOSD is an attempt at "management by consensus" and a means of sharing the responsibilities for decisions. Further they are tending to exclude those middle managers and supervisors who are near the "scene of action" and who are able to provide first hand knowledge. This creates the potential for reaching decisions without all the facts available.

5. The Organization Profile

The profile of an organization can be reflected in the distribution of skills and the ratios of management and supervisorsto the general work force.

A broad view of the AGOSD organizational profile shows the following:

| <u>Function</u> | <u>Position Grades</u> | <u>Number</u> | <u>% of Total Employment</u> |
|--|---------------------------------------|---------------|------------------------------|
| General Management (Top Management) | Under Secretary to General Manager | 5 | .2% |
| Middle Management | 1 and grade 2 (selectively) | 71 | 3.7% |

26

| | | | |
|-------------------|--------------|------|-------|
| Supervising Level | Grade 2 | 49 | 2.6% |
| Work Force | Grades 3 - 6 | 1792 | 93.5% |

Finding

The profile, although not completely accurate, tends to verify the perceptions gained during the review that there is a need for more supervisory and first line management personnel.

Although there is a need for additional "first line" management, numbers alone will not solve the problems unless more decision-making authority is delegated downward in the organization, closer to the scene of action. Competent supervision, with adequate authority will generally result in a better and a more responsive decision-making process.

C. CONCLUSIONS

The conclusions we have reached regarding AGOSD's organization are as follows:

1. Develop a specific organization plan for the further development and stabilization of the AGOSD organizational structure. These plans should:

- * Modify the organization structures to improve the span of control of executives, consolidate similar functions, provide for missing functions such as organization and systems development, shorten lines of communication and reduce the levels of management.
- * Define, specifically, the mission of each organizational unit to overcome current overlaps, and duplications in missions.
- * Acquire personnel to fill key management and staff positions that are vacant or filled by part-time people.
- * Plan for management succession and rotation of personnel.

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- * **Hold seminars and discussion meetings as the organization is changed to insure that key managers understand the changes being made.**

2. Evaluate and test organizational alternatives to the current organizational structure, such alternatives might include various groupings of organizational units under the control of Vice-Chairmen. Other alternatives to be considered may divide the duties of top management into a Chairman of the Board or Chief Executive Officer, and a Deputy Chairman of the Board or Chief Operating Officer. Exhibits one and two show only two alternatives to be pursued; there are certainly others. These are shown only as examples to illustrate the evaluation and testing process.

3. Evaluate, as a part of the overall organizational structure changes suggested in conclusion two, above: the following changes and additions to the AGOED organization:

- The addition of a Planning Department headed by a General Manager level executive reporting to the Chairman.
- The grouping of the staff functions into an organization headed by a General Manager to eliminate current unwieldy situation of all staff functions reporting to the Chairman.
- The addition of an internal systems improvement consulting group.
- The reorganization of Technical Affairs which would eliminate the Execution Department and replace it with a Project Management Department responsible for all construction managers.
- The consolidation of all operations and maintenance activities.
- The separation of Finance from Administration.

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- * The consolidation of all traditional personnel functions into a single organization.
- * The creation of a Training and Development Organization.

The changing of the current organization should require the active participation of AGOSD top management group, to evaluate alternatives, determine staffing, develop mission statements, and assist in implementation.

4. Develop specific position descriptions for the top and middle management, that clearly state the responsibilities of the position and the authorities granted.

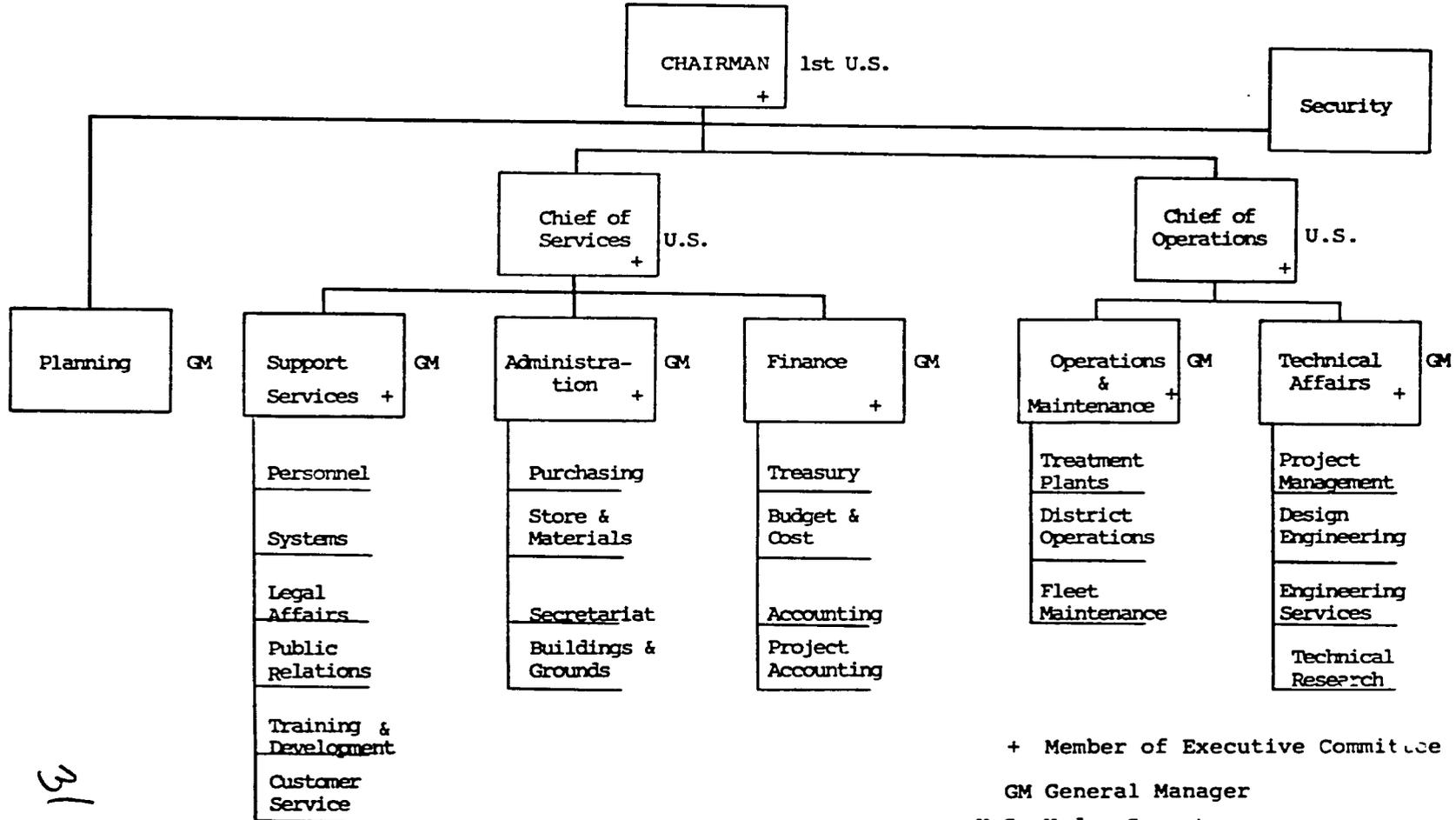
- * The development process should require meetings between superiors and subordinates to ensure that there is a real communication and understanding of the duties and responsibilities.

5. Develop an AGOSD management policy manual that contains the key policy statements and management guidelines that management and supervision can use in the day to day discharge of their duties. This manual should include, but not be limited to:

- * Statements of missions
- * Organization charts
- * Roles and responsibilities of standing committees.
- * Policies on:
 - Internal and external communications
 - Limits of approval for spending and purchasing.
 - Definition of problems requiring higher approval
 - Protection of property
 - Organization communication
 - General roles of "line" and "staff" function.
 - Chain of command definition

This manual should be issued to all management personnel and should be of the "loose leaf" type in order to accommodate the inevitable changes. The manual will be useful in briefing new members of management and will initially be the subject of seminars and discussion of the re-organization of AGOSD.

A G O S D
 ORGANIZATIONAL ALTERNATIVE
 DIVISIONAL STRUCTURE



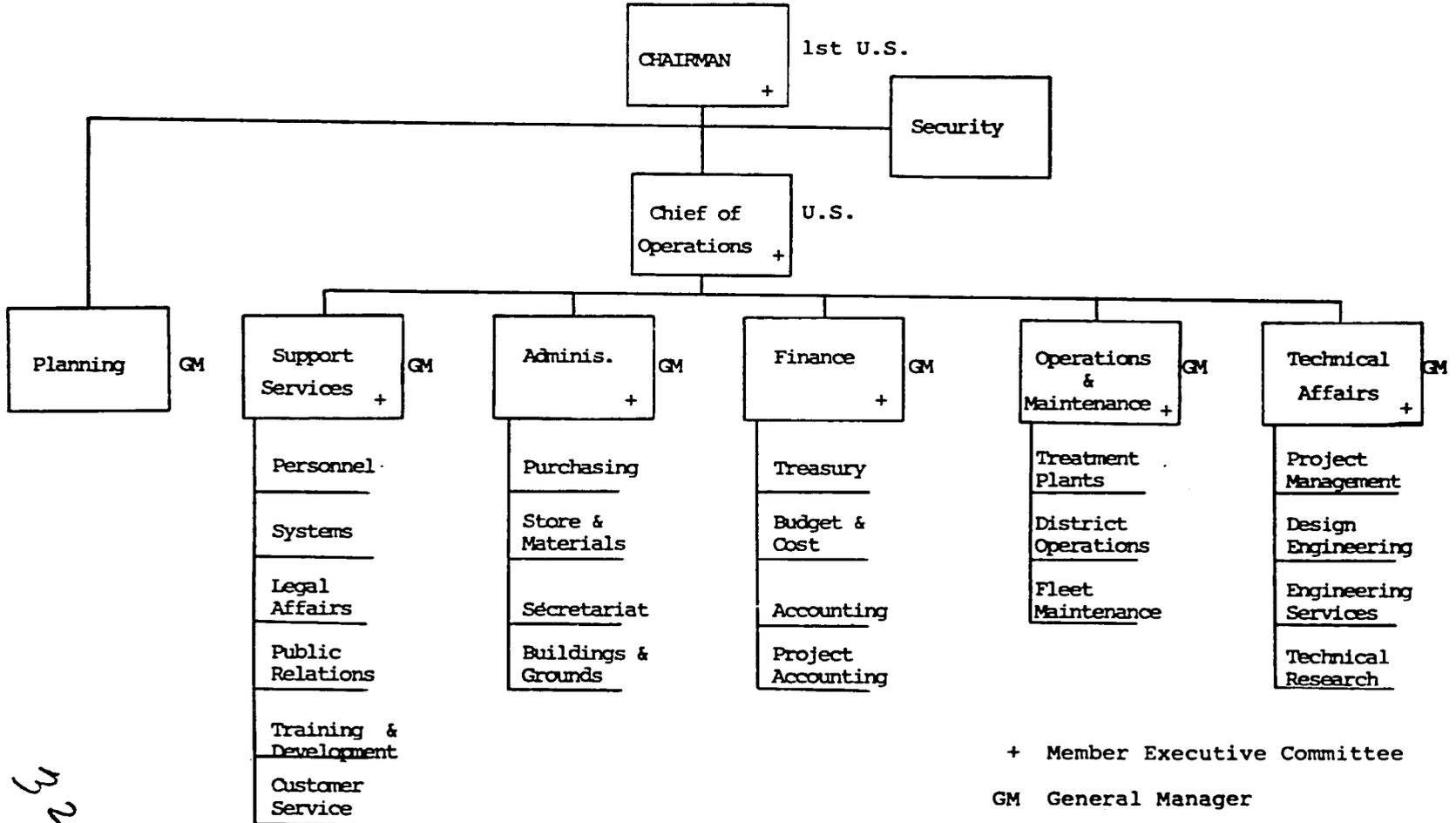
+ Member of Executive Committee

GM General Manager

U.S. Under Secretary

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ORGANIZATIONAL ALTERNATIVE
DEPARTMENTAL STRUCTURE



+ Member Executive Committee

GM General Manager

U.S. Under Secretary

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III. MANAGEMENT, SUPERVISION AND EMPLOYEE TRAINING

AGOSD, is a public utility operated by the government and as such does not analyzedecisions on a cost versus benefits basis. Further, the concepts of productivity, management accountability for both financial and operational decisions are not practiced nor completely understood. Many members of AGOSD's management group believe that mere complaine with the laws of Egypt represents the fullfilment of the requirements of their position.

This attitude and environment has created a psychological barrier which must be overcome in the development and training of managers and supervisors.

A. APPROACH

In developing this section of the report we conducted indepth interviews with managers, supervisors and several key employees. We focused a portion of these interviews in the organizations responsible for personnel acquisition, training and management.

B. FINDINGS

1. Current Policies and Programs

As pointed out in other sections of this report, AGOSD is a relatively new organization and has not been spared the pains and problems normally associated with new and developing organizations.

In this process, management and supervisory development and employee training have had to compete with a multitude of other projects and programs for the resources available.

Finding

Training and management development to date have received a low priority within AGOSD. For the fiscal year 1980-81 .025% of the total budget was allocated to this area. There are no records available that indicate how this budget is to be used.

There are no policies which state the position of management regarding training or any internally produced analysis of their training and development needs. However, most members of management do agree that training is needed. These needs are expressed in only very general terms.

Finding

Management's perception of training and development tends toward the more technical areas of engineering or wastewater treatment and less toward management, supervisory or employee training in non-technical areas.

The perceptions that were expressed even when oriented to management, supervisory or employee training tended to be expressed as a need for academic seminars rather than a specific, how-to-get the job done approach, oriented to increased employee productivity.

Finding

There have been no training or management development programs conducted to date, although there have been some assignments of personnel to work with foreign contractors with the hope and expectation that they would absorb some technical and managerial know-how from this association.

2. Employee Training Needs

The lack of documented clerical and administrative procedures which clearly define the steps, and methods to be used is a serious obstacle to training employees for their jobs.

Finding

Most employees learn their jobs by observing others perform them and not by following prescribed procedures. Consequently, there is no objective basis for determining the requirements for training, the procedures to help train new employees, or the standards to be used to measure their job performance.

The prevailing attitude of management is one of telling employees what must be done, but not providing the guidance or procedures to instruct them how to do the job. This situation often results in management and supervision themselves doing menial clerical and administrative tasks, if the employees do not get the job done.

Finding

Throughout the AGOSD organization, less than half the employees appear to be working. This is due to a combination of overstaffing, not knowing what to do, and a lack of incentive or pressure for supervisors to improve productivity.

The lack of concern for employee productivity and training are related. Because of the abundance of manpower available, supervisors tend to segregate work into small and often meaningless tasks which change frequently. Further with the masses of people available they could, if pushed, handle most problems encountered.

Finding

The lack of standard procedures not only effects the stability of the duties of employees but makes the assessment of specific training needs difficult.

There are currently, no incentives for supervisors to improve operations or for the employees to learn their job or to acquire the skills required to work more effectively.

3. Management and Supervisory Development

The educational backgrounds and the work experiences of the management personnel of AGOSD are of a rather limited functional or technical nature. Consequently, most of the current managers and supervisors are for the first time filling positions requiring either supervisory or broad management skills.

Finding

Management and supervision throughout AGOSD are not adequately prepared either educationally or by previous practical experience for their positions as managers or supervisors.

The management group within AGOSD does not seek responsibility or more importantly does not use or accept the responsibility that is already theirs to improve operations within their own organizations. Often, the labor laws were given as an excuse for not taking action while at other times it was a lack of knowing what to do.

Finding

There is a serious need to provide incentives for management to improve operations, and for management to replace subordinates who do not perform.

The promotion to a managerial or supervisory position within AGOSD, seems to be based on rather subjective evaluations and does not seem to be related to normally used measures of job performance. The promotions are from one grade to another and are in many cases, merely pay increases.

Finding

The criteria for promotion are vague and do not contain job performance evaluations. The experience requirements for most management positions as expressed in the job descriptions, are equally vague and do not specify

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the levels of previous managerial or supervisory experience required.

Throughout the review, we were generally surprised by management's lack of detailed knowledge of their operations, and a lack of rapport with their employees and subordinates.

Finding

The training of managers and supervisors must range from basic supervisory and human relations skills to the broader subjects of management and control.

C. CONCLUSIONS

The further development of managerial, supervisory and employee skills is dependent on many factors and cannot be solved solely by education and training. The organizational, systems and the improvements suggested throughout this report, are the necessary foundation to provide the environment and tools to manage.

It was also apparent that due to the shortages of technical managerial skills in the local area, that AGOSD will have to institute a continuing program of internal development.

1. Assign the responsibility for management development or training to a new major staff function for training and development.

Although the timing of this assignment will depend upon the development of documented procedures, complete position descriptions and the re-organization of AGOSD, the general responsibilities should include:

- * Assessing and identifying training and development needs.

- * Formulating general policies for training and development.
- * Developing master training plans.
- * Evaluating training activities and programs.
- * Reporting quarterly to the Chairman and the Board of Directors the progress, results and the future training needs.

2. Use the process of implementing the changes recommended throughout this report as a "real life" case study and as a training and management development vehicle.

For example the following areas could form the basis for initial management, supervisory and employee training.

Realignment of the Organization

- * Consultant to develop design concepts and general mission statements, responsibilities and authorities of key managerial positions.
- * Consultant to chair a series of working discussion meetings, after regular work hours, to explore and discuss missions, authorities and responsibilities, delegation of authority.
- * Require key managers to modify or make suggestions regarding organization, lines of communication and particularly their job descriptions, authorities and responsibilities.
- * Resolve views of Chairman and subordinates in working sessions.
- * Finalize organization structure, position descriptions, missions, etc. and the specific delegation of authority.

To effectively implement organizational changes, open discussions and participation are necessary to provide a common understanding and confidence in the changes being implemented.

Development of New Systems and Procedures

- * Assign the supervisor directly responsible for the system being reviewed to work with the consultant in developing and documenting new systems.
- * Develop new system and appropriate documentation under the supervision of the consultant.
- * Review new procedures with the top management of the department and obtain approval to install the systems.
- * Instruct the employees in the new system requirements, the consultant should assist the supervisor in presenting it to the employees.

The team approach as illustrated above, could apply to policy development, employee evaluation as well as other areas such as developing management information systems.

3. Develop a central AGOSD library containing technical texts, and papers covering wastewater treatment, pollution control as well as general management and supervisory subjects. Supplement this with subscriptions to current professional magazines and journals covering technical and managerial subjects, method and systems improvement.

4. Assess initial management and supervisory needs as the improvements are being implemented to provide the initial input to the AGOSD training and development function.

5. Develop a program of incentives for management, supervision and the employees to acquire training. These incentives should include but not be limited to the following:

- * Require training to be a criteria for promotion or for reviewing a pay raise.
- * Pay bonuses for training courses completed or for participating in designated management development activities.

- * Grant overtime payments for training outside normal work hours, and schedule most training during this time.
- * Award diplomas and bonus in a brief ceremony.
- * Publish the names of persons completing courses on AGOSD bulletin boards.

6. Evaluate supervisors, and managers on the achievement of productivity goals for their departments and for the development of other defined objectives. (This recommendation appears in other sections of this report, and is reappearing here because of its importance in the motivation of managers and supervisors).

7. Acquire audio visual equipment including a video camera, video recorder and TV to permit the recording of training seminar subjects so that managers and supervisors or the employees could review them on an individual basis.

8. Evaluate employee performance using criteria related to following procedures, attendance, cooperation, accuracy of work and other quantifiable measures.

9. Develop training programs, especially for employees and first line supervision which meet the following criteria:

- * Combine seminar or classroom discussion with on-the-job training.
- * Present concepts with extensive use of visual illustrations and audio-visual aids.
- * Structure the course in segments or modules that permit individual as well as group study to accommodate varying individual capabilities.
- * Design home study courses and require levels of understanding before advancing to other courses.

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IV. MANAGEMENT INFORMATION AND CONTROL

The process of management can be described as a closed system where activities are planned and performed. Performance is monitored enabling management to control the activities by adjusting future plans.

The key element of the monitor and control process is the management report. Such reports should regularly (monthly, weekly, daily, etc.) provide management with the information necessary to evaluate and control activities as they occur. Management reports should be designed to provide, on a timely basis, the specific information necessary for each level of management. The information content is tailored to fit the needs of the manager who receives it.

Generally, top management is involved in high level activities such as long range planning and as a result does not have the time and should not have the need to evaluate day to day operating reports. Reports oriented for top management are "exception" or action reports. If the results of activities are not in accordance with a predetermined criteria, the exception report notifies top management that their action is necessary. When activities occur as planned no exception report is issued.

Middle management reports are activity or task oriented. They describe to middle management the results of the day to day activities in their areas of responsibility. Such reports provide a record of activities that have taken place.

A. APPROACH

Our approach in reviewing the management information and control systems in use at AGOSD was to interview key officials

at all levels of the organization and to review the management reports that they prepare or receive. We have discussed with these officials their information needs and the methods by which they obtain that information.

In evaluating the management reporting system we have focused on:

- * The appropriateness of the reports received at various levels within the organization.
- * The timeliness of the reports.
- * Management's use of the reports to effectively control the organization.

B. FINDINGS

1. Current Management Reports

In general the concept of management by regular reports is unknown in AGOSD. The use of regular written reports occurs sporadically and seems to be restricted to a few key officials who prefer to obtain their information routinely in reports. Most management information is communicated verbally on an "as needed" basis, stimulated either by a specific problem or a committee meeting.

Finding

Considering the lack of telecommunications, the effect of this reliance on verbal communications is to occupy a significant portion of management's time attending meetings and gathering information. This leaves little time for the actual management function.

The following are general characteristics of the current management information and reporting system at AGOSD:

- * Most organizational units within AGOSD neither receive nor prepare any regular management report.
- * Information is not readily available in a form that is useful for management, resulting in the need for frequent special studies to gather information.
- * Management information is primarily exchanged verbally during a series of semi-regular meetings.
- * Most formal reports are required by other government agencies (i.e. Ministry of Finance) and thus meet the information needs of those agencies and not of AGOSD.
- * Because certain reports are required by the government, the majority of AGOSD officials believe that they are prohibited from creating additional related internal reports that would provide more useful information for the control of operations.
- * Regular management reports are not used in AGOSD because middle management tends to believe that top management might:
 - not fully understand the situation.
 - be uninterested
 - be too busy to read the reports

Although middle management has this impression of the information requirements of top management, the Chairman has indicated that he has tried to establish some regular management reports covering financial and operational statistics. However, this attempt has not resulted in the submission of regular reports providing this information to the Chairman.

Finding

Management reports currently in use within AGOSD are primarily associated with the finance and construction management functions. The infrequency of other reports limits their utility in management information and control.

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2. Financial Reports

There are four regular financial reports, three of which are required by government regulations. These three reports provide information in a format that is useful to various government agencies such as the Ministry of Finance but neglects the information requirements of AGOSD. The fourth report, for internal use, is structured similar to one of the other three.

- * Monthly Statement of Revenues and Expenditures - This report is prepared by Bookkeeping and submitted to the Ministry of Finance and the AGOSD Comptroller (who is a Ministry of Finance employee). The report provides the accumulated revenues and expenses since the beginning of the fiscal year for the current month, and the new cumulative totals. This data is broken down by line item (such as fuel, electricity, spare parts, etc.) However, there is no breakdown of costs by cost or responsibility center. The capital projects portion of the report is sent to the Technical Affairs Department as input to their project status reports.
- * Monthly Analysis of Expenditures for the Loan and Grant - This report is prepared by the Financial Affairs Manager with the assistance of the Public Relations Manager. It is submitted to the Ministry of Planning, the Ministry of Housing and the Governorate. While about eighty percent (80%) of the data on this report is static, the report does show that amount of funds spent and available for contracting for the USAID financial projects.
- * Quarterly Balance Sheet and Income Statement - This report is prepared by Bookkeeping and submitted to the Ministry of Finance and the AGOSD Comptroller. It provides the same basic information provided in the Monthly Statement with the addition of data regarding the line item budget amount.
- * Daily Trial Balance - This report is prepared by Bookkeeping and submitted only to the Comptroller. This report provides the basic daily balances for all accounts.

What is most notable about these four financial reports is that no-one in top management receives or uses a copy of any of the reports. It is also notable that the Public Relations Manager is involved in the preparation of financial reports. This function is clearly outside his area of expertise or normal responsibility. None of the four reports provides information that would enable top management to analyze the costs incurred in any particular organization unit. Officials in the financial area indicated that such information is available but that it would have to be restructured (for example - personnel would provide salary information, etc.) Without such information no manager can be responsible for the costs incurred in his organizational unit. As a result top management is responsible for all costs incurred but lacks the means to analyze how they are incurred.

Finding

No member of the top management of AGOSD or even the key finance officials receive any regular report of the financial status of the organization.

3. Construction Management Reports

Within the Technical Affairs Area the only regular written reports are prepared by the Execution Department. The Design Department issues no written reports and the reports issued by Technical Follow-up merely reiterate the same information reported by the Execution Department. The Execution Department reports are true management reports in the sense that they are requested by departmental management for the purpose of keeping informed about the status of the various on going projects. There are four Execution Department reports:

- * Resident Engineers Daily Report - This is prepared by the site engineer, with the assistance of the contractor and consulting engineer, and submitted to the management of the Execution Department. There are two versions of the daily report, one in English and one in Arabic. Both provide a written description of daily report progress and problems as well as enumeration of the contractor's personnel and equipment utilized.
- * Resident Engineers Weekly Report - This is prepared by the site engineer and submitted to the Execution Department Management. This report provides a quantified estimate of the work progress.
- * Monthly Project Progress Report - This is prepared by the site engineer, with the assistance of the Execution Department Management, and is submitted to the General Manager of Technical Affairs. This report provides analysis of progress and expenditures on the project, the estimated value of the work completed, project problems and their solutions, and information regarding interfaces with other public utilities.
- * Quarterly Follow-up Report - This report is prepared by the General Manager of Technical Affairs and submitted to the Ministry of Housing and the Governorate. This report provides a project cash flow analysis and enumerates the remaining funds available for the project.

It should be noted that the Execution Department Managers indicated that the Quarterly Follow-up Report is prepared by the General Manager of Technical Affairs. However, the General Manager was not familiar with the report and neither had a copy of it. This creates some doubt as to whether the report actually exists. More importantly it demonstrates the result of not having written procedures.

Finding

Two important managers working within the same functional area are not familiar with what each is doing or is responsible for.

The construction management reports, however do demonstrate that management can establish and maintain a regular

management reporting system. However, in order to achieve this, management must demonstrate the validity of the reports by responding to them and generally showing that the reports are having an impact. In this way, the employees who prepare the reports will realize that the reports are important and that top management is interested in them. In the Execution Department the managers are busy and thus have adopted a system of reports to keep informed. The managers respond to the contents of the report thus demonstrating to the site engineers that the reports are important and useful. The main draw back of these reports is that many of the site engineers, relatively inexperienced, are assisted by contractors in the preparation of the reports. Thus the report contents may be influenced by the contractor.

Finding

A good management reporting system must be perceived as important and useful by those who prepare the reports. This perception can only be imparted by a management who responds to the report contents.

4. Other Reports

Although the financial and construction management areas contain the most organized reporting systems in AGOSD, they are not the only areas that use regular management reports. However, the management reporting in other areas is not well organized, consistent or timely. These reports are oriented to the provision of information and seldom trigger any action or response. Some of these reports are:

Customer Service Section - A daily report of statistics and status of customer complaints. Submitted to the Chairman.

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- * Personnel - A yearly report of the total number of permanent, temporary, and loaned employees as well as the number of vacancies. Submitted to the Chairman.
- * Supply - A yearly report of the value of inventory on hand. A monthly report of the inventory activity at each of the sub-warehouses. Submitted to the Central Warehouse Manager.
- * Treatment Plants - The manager responsible for the treatment plants receives a daily, weekly and monthly report of activities at the plants and the laboratory.
- * District Operations - Each district manager prepares a dialy progress report and a monthly planning report of maintenance activities. This is submitted to the General Manager of Operations and Maintenance and sometimes to the Chairman.

These are the principal reports used to keep management informed of the status of various on-going activities in AGOSD. It is notable that these reports are general information reports rather than "exception" reports which would be issued to appraise management of a special situation requiring their immediate attention. Further, there appears to be no regular reports prepared by the line managers for the purpose of keeping middle management informed. The following neither receive nor issue regular reports:

- Legal Affairs
- Public Relations
- Employees Welfare
- Purchasing Department
- Vehicle Department

5. Organization and Maintenance of Management Information

Key elements of management information systems include

the organization and maintenance of the information. By organization we mean the preparation of the information that is required for management decision making in a format that facilitates such activities. Every report should fulfill a specific purpose and its format should be designed with that purpose in mind. The maintenance of management information involves the efficient storage of key information in a manner that enables its timely retrieval and dissemination.

Management information in AGOSD is not organized. The actual reports that are used are either free form reports that do not have a specific structure or they utilize government forms that do not provide information in a format that will be useful to the management of AGOSD. Those reports that are free form tend to provide written statements of activities rather than statistical analysis based upon a pre-determined criteria. Thus it is difficult to obtain consistency and comparability in the management reports that are prepared.

Finding

AGOSD has not defined its information requirements nor has it designed the appropriate forms for the provision of such information.

Some information is prepared and disseminated in standard formats. However, it is common to find that, unless the report is on a pre-printed government form, the preparer will have to draw the form prior to completing the information content of the report. AGOSD has not officially standardized its reports nor have they printed the forms. Further, photocopying facilities are not readily available for the reproduction of

of some report forms, such as the ones used in the district offices.

Finding

A large part of the efforts involved in preparing management reports is involved in a perpetual laying out of standardized report forms that should be pre-printed.

Most management information in AGOSD is maintained on various forms and registers. These forms and registers vary in size from as small as 12 cm. by 20 cm. to a large size of 50 cm. by 100 cm. Generally the large sizes are bound registers while the small and medium sizes are forms. Because of this variety of sizes and the fact that some documents are on separate forms and others in bound registers it is difficult to organized an efficient filing system that enables related documents to be maintained together. Further, in most offices there are no storage cabinets for documents. In the Financial Affairs and Personnel Areas important documents are stacked on the floor and on top of shelves. The registers are too large to be stored in a locked cabinet. Because of the size of the registers they cannot be readily photo-copied, a means of enabling more than one person to work with data from the same register at the same time.

Finding

Storage of important management information is unorganized and inefficient making it difficult to locate key documents when they are needed.

During non-working hours anyone who walks into AGOSD has access to look at and/or steal many key financial or personnel records.

Only one person at a time can work with key registers resulting in delayed access to important information and an inefficient use of manpower if two or more people need access at the same time.

In reviewing the registers that are maintained in the various areas of AGOSD, we have noted much duplication of information storage. One register may completely duplicate another register and add one additional piece of information. This is the case with the so called outgoing mail register and the "Sarki" register. In addition, all the information maintained by the Budget area is also maintained in the Bookkeeping area.

Finding

This duplication is an inefficient use of manpower. (two or more people doing the same job) and confirms the previous finding that AGOSD has not defined its information and information storage requirements.

C. CONCLUSIONS

It is apparent that AGOSD has not yet analyzed and defined its information processing and storage system. The management information that is available and the reports that are processed are a result of either government regulations or the desire of specific managers who prefer to rely on reports for information. In both cases the overall AGOSD information requirements have not been taken into consideration nor fulfilled. The following actions will enable AGOSD to establish an efficient management reporting system that will enable key managers to discharge their managerial responsibilities more efficiently and effectively. AGOSD should:

1. Undertake an integrated review of its information requirements. Such a review must define what information is required at each level of management and how that information can be efficiently supplied. Some of the key elements of this review would include:

- * An assessment of each manager's information requirements and an assessment of the most efficient source of such information.
- * The design of key registers for the maintenance of important management information eliminating the duplication of information storage.
- * The design of the key reports and documents that will provide the necessary information to managers in a format that they will be able to use without further alteration.
- * The reports and registers should be designed so that they are all of one standard size, compatible with the photocopying facilities that exist. All such reports and registers should be on pre-printed forms.
- * The assessment of the information storage requirements for each organizational unit with emphasis on standardized equipment and the secured storage of sensitive information and documents.
- * The definition of criteria that would trigger exception reports informing top management of important problems and required action.
- * Guidelines to be used by management in the analysis of the management reports so that appropriate response can be rendered on a timely basis.

It is true that certain documents must be used to supply information to various government agencies, particularly the Ministry of Finance. However, the officials of AGOSD should realize that the government regulations do not prohibit AGOSD from preparing any other appropriate information for internal management use.

2. Assist its managers to develop a management technique that is oriented toward the analysis of regular management reports and decision making based on the information provided in them. Management action should demonstrate that the management reporting system is effective.

3. Provide each office with sufficient cabinets to efficiently organize and maintain management information. Where appropriate these cabinets should have locks in order to limit access to confidential information only to authorize AGOSD employees.

V. SYSTEMS AND PROCEDURES

In a large organization, such as AGOSD, there are several organizational units whose activities, when properly performed, support the achievement of the overall goals of the organization. As a rule these activities are guided by many systems that define how the activities should be performed. The efficient interaction of these systems is what makes it possible for the large organization to achieve its goals.

To discuss the concepts of systems and procedures, particularly as they apply to AGOSD, we should first establish an understanding of what we mean by these concepts. A system is the interaction of many components for the purpose of achieving a specific goal. In an organizational system, these components include, but are not limited to, appropriately trained manpower, equipment, supplies, financial resources, etc. Such a system achieves the specific goals because there is a clear set of procedures that define the integration of these components.

Systems and procedures may be formal or informal. Formal systems clearly define, generally in writing, the interaction of the system components so that the goals are consistently achieved. Such systems are the result of an organized effort to define the specific goals and how they are to be achieved. Informal systems generally are not documented and result from an unorganized attempt to achieve some goals. Because the system is informal the application of procedures for the achievement of the goals is inconsistent.

A. APPROACH

Our approach in the evaluation of the systems currently in use at AGOSD was to interview key individuals involved in each system, review existing written procedures, and perform walk-throughs of the major systems. These walk-throughs involved a review of the processing steps and the key documents used throughout the system. In this way we were able to evaluate the adequacy and efficiency of the systems in fulfilling specific goals.

In performing our analysis of the systems currently in use in AGOSD we have reviewed systems in the following general areas:

- * Executive Level Offices
- * Administration and Financial Affairs
- * Technical Affairs
- * Operations and Maintenance

In this section we will discuss our findings relative to the systems and procedures used in these areas. However, the analysis of the systems and procedures followed in the Technical Affairs area is included in the Construction Project Management section of this report.

B. FINDINGS

1. Current Systems

Although there are several informal systems in use within AGOSD, no formal systems and procedures exist. Those informal systems and procedures that do exist are either based upon government regulations and laws or are carry-overs

of the internal systems that were established by GOSSD prior to the separation. The government regulations have been developed as general guidelines to all government departments and government owned organizations. These regulations were intended to serve the information and control functions of the government and are not specific enough to adequately serve as procedures for any one organization.

Finding

Government regulations tell management what should be done but do not provide the detailed procedures of how to do it.

In addition, these regulations are closely guarded by key supervisors who keep them locked in their desks. Employees who must perform the functions involved in any system do not have free access to the government regulations. As a result, in some cases these regulations are incorrectly applied.

Although AGOSD management has indicated that the former GOSSD internal systems no longer apply to AGOSD, these systems are still in use in some areas. These systems are more specific than the general government regulations and they are oriented toward the requirements of a sanitary drainage organization.

In general it can be said that the internal systems in use at AGOSD have grown out of the government regulations and the GOSSD systems. With these as a base, employees have developed their own procedures to accomplish the specific goals that they are required to accomplish. These procedures are unique to the individual performing the task and are not

documented. New employees must either learn the system from experienced employees or develop their own. In most cases what happens is a combination of both.

Finding

The informal systems in use at AGOSD are usually personal adaptations of an old GOSSD system or government regulations to which most employees have no access.

Before addressing the specific systems of each area, it is possible to make several observations that apply to all systems currently in use at AGOSD.

- Most areas do not have clearly defined goals and objectives and as a result their systems are not based upon specific goals.
- Procedures are not documented and specific responsibilities are not assigned to specific individuals.
- The integration of system components has generally not been defined resulting in overlapping responsibilities and duplication of effort.
- Formalities of inter-departmental communications obstruct the smooth and efficient flow of documents within systems.
- Lack of adequate support equipment decreases the efficiency of specific systems. For example the Bookkeeping Section has one calculator for sixteen employees.

A common characteristic of all systems in use at AGOSD is that top management personnel are involved in many of the procedural steps of systems. Often this involvement is not necessary and the task would be more appropriately delegated to middle management.

Finding

The fact that the current systems have never been formalized results in the inconsistent application of procedures leading to an inefficient and untimely fulfillment of goals.

The following is a brief analysis of the informal systems that currently exist in the various functional areas of AGOSD.

2. The Executive Level Offices

The executive level offices are the Office of the Chairman and those staff offices that report directly to him. These offices include:

- * Legal Affairs
- * Technical Office for Experience and Communications
- * Public Relations and Complaints
- * Security
- * Customer Services

These offices provide assistance to the Chairman on tasks within their specific areas of expertise. However, as has been previously noted in the Organization Section of this report, many of these offices also perform functions that do not fall within their areas of expertise. A good example of this is the office of Public Relations and Complaints. This office maintains employee attendance, assists foreign contractors, investigates employee complaints and follows-up on activities assigned by the Chairman. As a result of this divergence of activities it can be said that the mission of the executive level offices is to assist the Chairman on an "as needed" basis in any area required.

With this breadth of activities, it is difficult for these offices to establish functioning systems. They basically receive requests for assistance and respond to the request as appropriate. The one office that has tried to establish systems and procedures is the newly created Customer Service Office. This office has a specific mission and thus is able to define systems and procedures for its fulfillment.

Finding

The executive level offices have confused or undefined goals and objectives and because of this they are unable to develop standard systems and procedures.

3. Administration and Financial Affairs

The Administration and Financial Affairs area provides AGOSD with vital administrative and financial support. The area has been described as the vertebrae of the organization. The basic support functions performed are:

- * Personnel Administration
- * Purchasing and Warehousing
- * Finance and Accounting

The personnel administration functions have several basic activities for which informal systems and procedures exist. These systems include employee hiring, employee welfare, staff evaluations and payroll. Almost all of these functions are closely controlled by government regulations, which provide the only written documentation of the systems. Because only supervisors have access to the regulations, the employees' understanding of the systems and procedures is limited to the verbal guidance received from responsible supervisors. The

basic problem is not limited to a lack of defined procedures but also includes the involvement of too many committees and offices without a clear definition of responsibilities. For example, although there is a Manager of Administrative Affairs and a Manager of Personnel there is also a Personnel Committee which is said to manage all activities related to personnel. It is difficult for a system to function effectively if the responsibilities of each participant are overlapping and not clearly specified.

Finding

The effect of government regulations and the fragmented, undefined responsibilities have limited the effectiveness and flexibility of the personnel administration systems.

The functions of purchasing and warehousing are closely related and their systems are integrated. Here again the governing factor in these functions is government regulations which tend to be general in nature. However, in the case of the purchasing system, the regulations have become more complex as USAID assistance has introduced new requirements for the system. No one within AGOSD has ever made an effort to determine how the various regulations should be applied for the greatest benefit to AGOSD. The systems and procedures followed are generally oriented toward the procurement and receipt of large items, usually through a bid process. The process, for the purchase of small items is so complex that foreign contractors are told to buy them and submit the receipt for reimbursement.

Many of the systems in use are not documented or standardized. No standard inventory locator system exists, resulting in unnecessary purchases. Systems that could help AGOSD control its purchases and inventories are not used even though they are required by government regulations. For example, normal statistical methods of determining inventory levels, purchase quantities, and re-order points are unknown at AGOSD and a consistent method of inventory valuation is not used. The procedures used for the approval of purchases too often involve top level management in activities that should have been delegated to middle management.

Finding

AGOSD's total reliance on generalized government regulations, to the exclusion of other potentially beneficial systems, has resulted in an inefficient use of resources and a lack of control over their use.

Like the personnel, purchasing and warehousing functions the financial and accounting systems are predominantly influenced by government regulations and the Unified Accounting System. These regulations have been established to provide the government a mechanism to obtain information and control over the finances of various government owned organizations. The current systems are entirely dedicated to the preparation of government mandated forms and registers. AGOSD has not attempted to develop internal financial systems that would provide important management information. Only rarely has AGOSD adopted a financial system that is not required by government regulations.

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Currently, the only such system is the foreign contractor project accounts, a subsidiary ledger.

The financial systems in use at AGOSD include: budgeting, maintenance of the general ledger and subsidiary ledgers, receipts and payments. The budget and subsequent accounting records are keyed to the Unified Accounting System and do not provide AGOSD a method of controlling or analyzing expenditures. The budget itself is developed by a top management committee, without departmental input, and is viewed as a mechanism to obtain yearly funding from the Central Government. A more complete discussion of budgeting is included in the Planning and Budgeting Section of this report.

Given that the financial systems provide information that is not useful for the management of AGOSD, no effort is made to perform any financial analysis. Such techniques as ratio analysis, responsibility accounting, present value analysis, etc. are unknown.

As with the procedures in other areas of AGOSD, the financial systems and procedures are only documented in the government regulations which are available only to some supervisors. In some cases the actual intent of the government regulations is misunderstood resulting in a misapplication of the regulations. Each employee of the Financial Affairs area specializes in one segment of a system and no-one has a complete understanding of an entire system.

Finding

The financial systems in use at AGOSD, dedicated to providing information to the Ministry of

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Finance and other government departments, do not provide the financial information and control necessary to manage a large organization effectively.

3. Operations and Maintenance

The Operations and Maintenance Area is responsible for the operation and maintenance of the treatment plants and the collection systems. With this objective, the area is organized into a treatment plant division and four maintenance districts. Because the Vehicle Department supports operations and maintenance, they are also included in this area.

AGOSD has two wastewater treatment plants, generally referred to as the East and West treatment plants. The Western plant is still under construction and the Eastern plant has not operated for approximately one year. The Manager for Treatment Plants has stated that there are no operating procedures for the plants. He has instituted an informal system used by the plant managers to report regular maintenance activities to him.

Finding

There are no formal or informal procedures for the operation of the treatment plants.

The four districts have the responsibility to operate the pump stations and maintain the networks. In so doing they require the use of systems for the following functions:

- * Pump station operation
- * Preventive maintenance
- * Emergency maintenance

Although there are no written procedures of any kind in the

districts, they have developed informal systems to manage these functions. Preventive maintenance systems provide for the development of monthly schedules and emergency maintenance in on an "as needed" basis. Lacking direction and guidance from the management of Operations and Maintenance, the districts have developed their own procedures. No effort has been made to ensure that these procedures are consistent from one district to another and as a result they are not consistent. Through maintenance experience, the districts are able to provide information and/or evaluations of new systems that are being designed and constructed. No system exists for the provision of this type of information and as a result some newly constructed systems operate less effectively than they should.

Finding

The same functions are performed in four districts in four different ways because no formal integrated systems have been developed for operations and maintenance.

The Vehicle Department is responsible for scheduling the use of all AGOSD vehicles and for the repair of vehicles as well as other equipment. The department is also responsible for the general maintenance of all AGOSD facilities. Although no system exists for the scheduling of vehicles government regulations require the use of several standard forms and registers. The procedures followed in the scheduling and dispatch of vehicles revolve around these forms. The repair and maintenance functions are performed in accordance with written procedures that have been in use since AGOSD was

a part of GOSSD. These systems could adequately control the provision of maintenance services within AGOSD with the exception that top management interference in the day to day operations have rendered the systems ineffective. Procedures cannot be consistently performed. Regardless of how formal the systems may be they cannot be effective because of the inadequacy of several key components, such as manpower, equipment and space.

Finding

Within AGOSD the closest thing to a formal system is that found in the Vehicles Department. However, it is unable to function efficiently or effectively because of a lack of resources and the interference of top management.

C. CONCLUSIONS

Formal systems have never been developed in AGOSD and no serious systems review and design has ever been conducted. Those informal systems that are in use evolved from the specific needs of each office rather than from a concerted effort to develop coordinated, integrated systems. The systems currently in use tend to be inefficient for a number of reasons:

- * Lack of definition of the goals and objectives of AGOSD and each of its organizational units.
- * Lack of delegation of authority and responsibility.
- * Lack of written procedures.
- * Lack of adequate resources.

AGOSD can only address the concept of systems after it puts into effect a firm organization chart with clearly defined goals and objectives for AGOSD as a whole and for each of its

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organizational units. Such a chart must also clearly establish the specific authority and responsibility delegated to each office.

The following actions should be undertaken by AGOSD so that efficient and effective systems can be implemented:

1. Identify the key management functions that are required in each functional area to enable the organization to be efficiently managed. In this regard, AGOSD must understand that government regulations are intended to provide the Central Government with the information and control that it requires. These regulations are not intended to prohibit AGOSD from using other management techniques for its own internal control.
2. Review AGOSD's systems requirements to determine what systems are necessary and how these systems interface with each other to achieve the specific goals of the organization and each of its organizational units. This review should be closely coordinated with the management information requirements review (recommended in the Management Information and Control Section of this report) in order to assure that the systems will provide the required management reports.

For each identifiable system, this review should consider:

- * The specific procedures required to achieve the systems objectives.
- * The specific resources necessary.
- * The responsibility of each individual involved in the system, to avoid duplication of responsibility.
- * All responsibilities should be placed at an appropriate level within the organization.

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- * The criteria to be used for key decisions that form a part of the systems procedures.

3. Apply systems and procedures consistently so that the organizational goals and objectives can be efficiently achieved. Top management interference disrupts this consistency and reduces the effectiveness of the systems.

VI. PLANNING AND BUDGETING

Most public utilities require an integrated planning and budgeting system that combines long range and short range planning with the annual budgeting process. Such integrated systems provide "closed loop" communication procedures that ensure the consistency of planning assumptions, projections and objectives throughout the organization.

The planning process must be a documented system which clearly defines the steps necessary to communicate policies, objectives, and needs both upward and downward within the organizational structures. The system must also establish the responsibilities for planning the schedule of events, and define the review and approval process for the various department plans as well as the complete plan.

A defined and rigidly controlled planning system can be an important device that management can use to control current operations as well as structured approach to anticipating the future.

A. APPROACH

Our approach to reviewing AGOSD's present planning activities was to interview the key members of management who are involved in planning. We also reviewed the Master Plan, including the Top Priority Projects (TPP) as well as the AGOSD's own Five Year Construction Plan. Additionally the review covered the current budgeting process and its relationship to the plans developed.

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From these interviews and documents, we diagrammed the planning process as it is now being accomplished. This diagram was reviewed with managers involved in planning to verify our understanding of the procedures now being used in AGOSD.

We further evaluated the effectiveness of the planning system, as a means for:

- * Ensuring the consistency of the assumptions used to formulate plans and objectives throughout AGOSD.
- * Providing a long range perspective to the planning of operations and administrative support in the various departments and functions within AGOSD.
- * Establishing projects and programs and allocating financial, human and other resources.
- * Measuring actual achievement and performance against the plans developed.
- * Controlling the planning process and ensuring the efficiency of the development of plans.

B. FINDINGS

1. Plan Development

Currently there are separate plans within AGOSD; there is AGOSD's own Five Year Construction Plan and the Master Plan for Alexandria Waste Water Treatment developed by consultants for AGOSD.

The Master Plan is a long range plan requiring approximately 93,000 new property connections, 1040 km. of additional lateral (street) sewers as well as the principal conveyances,

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and treatment facilities. The initial programs in the Master Plan have been designated Top Priority Projects (TPP). These programs were developed to repair, improve and extend the existing collection system as well as to up-grade and rehabilitate pump stations and treatment plants. The Master Plan is currently being reviewed by consultants but the major projects of this plan have been approved by the Central Government.

AGOSD has developed a Five Year Construction Plan separate from the Master Plan, and from this plan they developed an Annual Construction Plan. Both the annual and the five year plans are largely developed by the Technical Affairs Department and the Technical Office for Experience and Communication.

The Annual Construction Plan for the current year, 1980-1981 contains projects costing approximately eleven million (11) Egyptian Pounds. Many of these projects span more than one year and as a result the costs represent both new projects as well as projects carried over from previous years.

The AGOSD Five Year Plan and the Annual Construction Plan are developed to address the following:

- Public Complaints
- Areas subject to frequent flooding of sewerage
- Areas currently not served by sewers and that can be accommodated by the existing collection system

Areas of high visibility which adversely impact the tourist industry.

Finding

The existence of two separate plans, the TPP projects of the Master Plan and the AGOSD plans not only complicates management control, but greatly increases the potential for the ineffective use of AGOSD resources.

2. Coordination of Plans

The annual AGOSD Construction Plan is coordinated with the Master Plan and we were told that none of the projects in this plan conflicts with the Master Plan.

Finding

The procedures for coordinating the Annual Construction Plan with the Master Plan are not clearly defined or documented to the degree necessary to ensure that there are no conflicts between plans.

The planning and execution of new construction projects while the Master Plan is being revised could result in the ineffective use of human and financial resources regardless of the amount of coordination.

The criteria for selecting projects to be included in the AGOSD Annual Plan are not documented and we were not able to determine how one project is selected over another.

There is limited communication of the Annual Construction Plan to Operations and Maintenance, Administration and Financial Affairs, and other organizational units. In addition, there is no evidence that these departments use the same planning assumptions and objectives, or consider the effect of new facilities on their needs for personnel, equipment and supplies in developing their own plans and programs.

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The plans developed in these departments are not long range, nor are they geared to levels of actual activities based on realistic assessment of needs. This planning can best be described as an annual budgeting process, because they are based on an extrapolation of prior year spending levels.

Finding

The planning of manpower, essential support equipment, and systems is not based on a realistic assessment of needs, current conditions or the expansion plans for new facilities.

The result is that past inefficiencies are built into the continuing plan. The lack of an integrated planning system is a major factor causing the imbalance of manpower that currently exists; where some areas are understaffed while others are overstaffed. It may also cause the lack of support equipment such as typewriters, calculators, and mechanic tools as well as inadequate work spaces and shortages of maintenance equipment.

Finding

The lack of integrated planning with common assumptions as to levels of activities and future needs, could seriously impact the ability of AGOSD's management to effectively operate a modern waste water collection and treatment system.

3. Control of the Planning Process

Effective plans are often the result of the organization of the necessary planning steps into a tightly controlled system. Such a system defines the policies, the responsibilities, the timing of events, and the procedures necessary to develop

long range plans and objectives as well as annual plans and budgets. In these systems, the annual budget is merely an expression, in financial terms, of this year's plan and projects.

At AGOSD, the planning steps have not been formally organized into a controlled system, nor have policies and guidelines been issued. The planning is being controlled, and in fact largely accomplished, by two to three key members of management, who have other significant responsibilities.

Finding

The plan development at AGOSD is fragmented in several organizational units and is a part-time or extra duty added to managers who already have significant work loads.

Although, the current organization chart of AGOSD provides for a planning function, we find that this function is mainly concerned with the follow-up of plans and troubleshooting for construction projects.

Finding

The lack of a full-time, high level manager of planning is limiting the scope of planning primarily to facilities and causing the inconsistencies in the planning done in operations and other support departments within AGOSD.

An example of these inconsistencies in planning are the current plans for manpower. These projections show the total permanent employment increasing from a current 1900 employees, to a level of 4000 in 1981-1982 and to 6000 by 1983. The expansion of plant and facilities and the level of other activities will not grow by amounts approaching these projected personnel increases.

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Finding

The lack of a controlled planning system, and the lack of communication of common assumptions and goals, can result in an ineffective use and allocation of resources. The addition of employees at the magnitude planned, would represent such an ineffective use of resources.

The addition of employees must be coordinated with the provision of necessary training, work space, tools, equipment and other facilities, if they are to be utilized effectively.

4. Assessment of Needs and Budgeting

The budgeting of supplies, equipment and manpower, as mentioned earlier, is not coordinated with the facilities and is primarily based on prior year spending levels.

Finding

There is no re-evaluation of past programs and current needs, or consideration of current efficiency levels. Consequently, past inefficiencies are carried over into the new budget and budget levels may not reflect AGOSD's present and future needs.

The concept of holding individual managers responsible for spending and for payroll cost is simply not understood. Perhaps this is due to their lack of participation and therefore a lack of understanding of planning and budget development. Consequently financial matters have become the responsibility of someone else.

Finding

Government regulations or laws are used as an excuse for not exercising control. These regulations once complied with, do not however, prevent AGSOD from developing cost or responsibility centers and using the budget as an internal control.

The current situation is conducive to "empire building" and managers are motivated to enlarge their staffs simply because this increases the status of their own positions.

Because the budgets are not organizationally oriented and spending is not time phased, only quarterly budget reports are issued. These reports are issued to the Comptroller and the Ministry of Finance. Most managers within AGOSD are not aware of the financial aspects of their operations.

We have also noted that government regulations require AGOSD to be the "employer of the last resort" under the full employment laws of the Egyptian Government. However, only approximately 10% of the current total headcount of AGOSD is such employees, which means some 90% of the manpower is controllable.

C. CONCLUSIONS

The conclusions we have drawn are divided into two groups: Planning and Budget Development.

Planning

The planning process within AGOSD should be defined, and structured, and the system documented. We have drawn the following specific conclusions AGOSD should:

1. Consolidate the two major facilities plans; the AGOSD Five Year Plan and the Master Plan, in order to eliminate the possibility that the plans may conflict with one another and to reduce the potential for the ineffective use of resources.

We have concluded that the "local" projects are initiated to meet pressing needs and are often the result of political

pressures exerted on AGOSD's management. It is understandable that public officials want to be responsive, it may be in the long term best interest of the residents of Alexandria, for management to bear these pressures until a single comprehensive plan can be developed. The current situation of having an AGOSD Five Year Plan, an Annual Construction Plan and a Master Plan could result in construction which will have to be changed, razed, or that will have to be redesigned in the Master Plan, all of which represents an ineffective use of resources. As mentioned earlier in this report AGOSD must move from fighting current problems and begin to anticipate the future. This may require delaying the solution of some problems a little longer.

2. Establish a strong central planning department. This department should have the responsibility and authority to control all aspects of planning including:

- * Coordinating all planning activities within AGOSD.
- * Communicating the assumptions and projections used to develop the facilities plans throughout the AGOSD organization.
- * Providing the interface among the various organizational units within AGOSD and a means to communicate management strategies and objectives downward in the organization and the assessment of needs and programs to accomplish these objectives upward in the organization.

We have concluded that a strong central planning organization is needed to coordinate all planning activities as well as to act as the "manager" of special studies required for developing long range planning alternatives for AGOSD.

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Further, we believe that a sound planning function is an essential element in moving the AGOSD organization away from dealing with today's problems and more toward anticipating future problems and planning their solutions.

3. Develop an integrated planning system which would clearly define the AGOSD policies and approach to planning. The design of this system, should identify the sequence and timing of the planning activities, and define the responsibilities of the planning department as well as the responsibilities and roles of the management of AGOSD at all levels for developing plans.

The planning system, or structure should be an efficient and controlled process. There should also be audit trails, or documentation of the assumptions used and the support for the planning decisions made. For these reasons, it is imperative that the system be clearly documented. This documentation would be helpful in training managers in planning concepts.

4. Develop planning guides for each organizational unit within AGOSD which defines the scope, level of detail and the planning horizon (years ahead) expected.

Consideration should be given to establishing planning assistants or coordinators in each of the major organizational units, Operations and Maintenance, Administration and Financial Affairs, and for the staff services. Their function would be to work with central planning and to administratively control the development of department plans.

5. Develop a planning Manual that documents the AGOSD policies regarding planning and the procedures, forms, and time schedules that should used and followed.

Budget Development

The current budget process should be used to build management controls and performance measurements. We have concluded that major changes should be made to ensure that the budget process becomes a part of planning.

We view the annual budget as the detailed and therefore specific plan for the year which relates the (LE) pounds to be spent to the work to be produced and the objectives to be achieved. We have seen this concept being partially applied on some construction projects at AGOSD, and believe these same concepts should be adapted and applied to the budgeting of manpower, equipment, and supplies throughout the organization. Relating budgeted manpower levels to increased levels of activity or to volumes of work produced may be helpful in justifying budgets to the Central Government Organizations responsible for reviewing, approving AGOSD's budgets.

6. Develop an annual expense and manpower budget that is divided and assigned to "responsibility or cost centers" so that managers can be held responsible for financial control. The spending and manpower budget should be time phased or allocated into monthly segments. Once the budget is divided, organizational monthly reports should be routinely issued to those managers showing their performance in relation to

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their unit's budget.

7. Assess budget requirements for each organizational unit based on current levels of activity, volumes of work and the impact of facilities expansion plans on the work to be accomplished.

This approach would require managers each year to re-evaluate their operations. This evaluation should relate manpower and/or equipment needs to specific objectives, goals and the amount of work to be handled. The objective is to instill in the managers a sense of responsibility for efficiency and the management of human and other resources.

A broad measurement of the work volume or activity indices can be developed for most organizational units. Typical indices include the number of invoices processed, number of purchase orders issued and vehicles inspected. Occasionally one department's work can be related to another department's activities. It becomes a matter of testing, over time, to determine which index moves in direct relation to work volumes.

It should also be recognized that there are organizational units which cannot be related to work volume, however, these generally do not involve large amounts of manpower or expenditures.

8. Evaluate managers and supervisors on the basis of their actual performance against budget. This basis should also be used in awarding bonuses.

VII. CONSTRUCTION PROJECT MANAGEMENT

AGOSD is beginning to implement a Master Plan, spanning approximately ten years, to up-grade and expand the Alexandria Sewerage System. The execution of this plan will require effective project management. For this reason, we have briefly reviewed the area in this report.

Project Management relates to all events and key milestones that must be controlled and monitored in the administration of all construction projects. The overall goal should be to achieve for AGOSD, projects that are constructed: (1) at a fair price, (2) within a reasonable time frame, and (3) to produce a high quality facility.

Project management starts when definite requirements begin to emerge during the planning phase, through facilities study, design and construction. Project management ends when the completed and tested facility is turned over to the using organization, who is then "forever more" responsible for its operation and maintenance.

A. APPROACH

The approach to this section of the review was to perform a general assessment of the organizational relationship of design and construction and to observe the current construction management procedures. This included contracting methods, scheduling, execution and inspection. Discussions were held with the key managers involved with design and construction, as well as with middle managers, resident engineers and site engineers. In addition to these interviews, site visits were made to observe a number of current construction projects.

B. FINDINGS

1. Project Design

The typical Engineering Design Department receives, from the project managers, the general scope of the project, basic fundamental requirements, and the estimated cost for construction. The Department schedules the work to be accomplished, assigns a "lead" engineer for the project, and tasks other disciplines on a full or part-time basis to participate on the project team so that the plans, specifications, and estimates can be completed by a specified date.

In our review of AGOSD's engineering staff it was found that the design department today is not totally effective. It does not have sufficient breadth of engineering disciplines, supervision, space, equipment or ambiance to perform in a professional engineering manner.

The department is not reviewing the Top Priority Projects or other Master Plan projects being designed by U.S. consulting engineering firms. The resident field engineers rarely use the design staff to assist them in solving construction problems resulting from changed field conditions or other requirements.

Finding

The Design Department is too small and is deficient in appropriate engineering disciplines, equipment and adequate work space to perform the normal mission required of a Design Department.

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2. Contracting Procedures

Normal contracting procedures use "fixed price" contracting to construct new discrete increments of work. AGOSD uses "unit price" contracting procedures for its new construction projects. After receipt, tenders are evaluated in closed session by an AGOSD committee. This committee usually awards the contract to the lowest conforming tenderor. Occasionally all tenders are rejected by the committee as non-conforming, based on contractors past poor performance, their lack of resources, bids that are too high, etc. New tenders are selected from a group of qualified contractors. The Selection Committee then enters into negotiation with these tenderors and one is awarded the contract. The objectives of this committee are said to be to:

- * Lower the bid price
- * Reduce the number of contractor condition clauses.
- * Reduce the project completion time.

However, there are no formal, written procedures or guidelines that specify how the committee should achieve these objectives.

Finding

The unit price method of tendering contracts can lead to subjective evaluations in making construction contracts awards.

Detailed and standardized procedures, as well as documented criteria for evaluating tenders, have not been developed.

3. Project Management

The flow and control of improvement projects through planning, design, contract administration and construction is not monitored and directed by a single organizational unit. Various individuals handle the work at different stages of development without the direction of a single individual or organization to ensure that all segments are proceeding in a timely manner and prioritized in accordance with an overall master plan.

Finding

The traditional concept of 'cradle to grave' project management associated with organizations having substantial facilities and improvements work, does not exist.

There are three "part-time" managers with responsibilities for construction projects. One manager handles the construction of treatment plants, pumping stations, foundations, tunnels, soil mechanics and trunk sewers. A second manages the construction of collectors, manholes, lift stations and trunk sewers. Another manager, who works directly for the Chairman, is responsible for the construction of "force main" systems. Each has a different, personalized approach to construction management. In addition, we have noted managers from the Operations and Maintenance Area giving instructions to contractor personnel at the job sites.

Finding

The management of construction projects is fragmented among several organizational units. This situation confuses the chain of command and complicates the development of unified policies, procedures and the developmental training of field engineers.



There is not a unified AGOSD voice giving instructions to contractor personnel and often the contractors receive contradicting instructions.

The change order procedures used, vary depending on the individual project managers. Some managers accumulate all the changes made during the entire course of construction, and then issue just one "catch all" change order at the completion of the project. While another manager correctly prepares change orders as changes are encountered. Others use no change order procedures, i.e. payments are made providing the units billed do not exceed the 125% parameter specified in the contract.

Finding

Uniform, standard contract procedures should be used in negotiating and preparing construction contract change orders.

The resident site engineering staff consists of young (mostly female) engineers who are assigned to get field experience. Under the "unit price" contracting procedures these engineers play a major role in making "quantity surveys", which are used to verify the monthly invoices for contract payment. They also validate "line and grade" dimensions using contractor equipment to ensure conformity with contract documents. They generally receive their instructions verbally from the several construction managers. In addition the site engineers receive some assistance from the U.S. engineering firm representatives who are responsible for the sewerage system design. The site engineering staff has no authority to enforce the contract provisions. All disagreements,

no matter how insignificant, are referred to the several managers of construction for resolution.

Finding

Assigning young engineers to resident construction sites to gain experience is a well founded practice to enhance engineering development.

The resident site staff requires detailed, uniform procedures to follow in the performance of their duties. These procedures should give the resident engineer some authority and responsibility to execute minor change orders.

Most Egyptian contractors traditionally work long after the contract date specified under the contract. Part of the reason is that they usually have a great deal of difficulty identifying the equipment and personnel resources necessary to complete the requirements under a contract. Schedules submitted under the contract are rudimentary and the resident engineers do not rely on them because they are in a "constant state of change". The Critical Path Method (CPM) for contract scheduling and control is not used. One contractor on a large 23 kilometer sewer collector project utilizes a joint venture US/Egyptian project management consultant to assist them in meeting contract requirements. The consultant through conferences with the contractor, sub-contractor and major suppliers prepares an Overall Project Schedule (OPS) in a time scaled, calendar dated unsophisticated network. This one contractor is attempting to complete a scheduled three year project in two years using these management tools. The contract is nine months old, progressing well, and exhibits a good team relationship between the contractor and AGOSD site engineers.

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Finding

One contractor's employment of a US/Egyptian Joint Venture Project Management Consultant is proving very beneficial in the timely execution of one construction project.

C. CONCLUSIONS

It is apparent that the expanded sewerage system program for Alexandria will tax AGOSD's limited project management capabilities to direct and control the design and construction of this major construction effort.

We have formed the following conclusions to assist AGOSD in improving its project management capabilities in order to execute the expanded design and construction program.

1. Improve all aspects of engineering design to include additional supervision, an increase in the number of engineers and the mix of engineering disciplines. To serve this increase in staff adequate space and engineering/drafting equipment should be provided.
2. Develop standards and procedures to be used by the committees involved in reviewing tenders pursuant to contract award and ensure that all actions by the committees are well documented.

The current practice of rejecting all tenders when the committee considers none to be conforming, then opening negotiations with "selected" tenderors is an unusual practice.

Re-advertising the contract project, is preferable and would be more beneficial to AGOSD.

3. Evaluate the use, on a trial basis, of the more traditional form of "fixed price" contracting when constructing new

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facilities having discrete increments of work.

4. Establish the role of one single construction project manager and develop standard policies and procedures to streamline and shorten the channels of communications.

5. Provide decision making authority at the scene of action where resident engineers have the benefit of first hand knowledge and conditions.

6. Implement uniform change order procedures to simplify administration of projects and provide a clear audit trail of project changes.

7. Develop policies and site engineering procedures to control and direct construction projects in an even handed and uniform manner by all resident site engineers.

VIII. MANAGING FUTURE GROWTH

The purpose of this section is to briefly summarize the requirements and constraints, that AGOSD must address in both managing expansion projects and in eventually managing a modern sewer system.

1. General Observation

Since its inception, AGOSD's management has devoted most of its time and energy to the planning, engineering, and construction of the physical facilities of the sewer system. The importance of the system and plants cannot be questioned, however, a more balanced approach which developed the organization, the management, the systems and that provided the tools and equipment needed to support this expansion might have avoided the current stressful and crisis oriented atmosphere.

With the planning of physical facilities being resolved, there should be a re-orientation of plans and perhaps the re-allocation of resources to provide the management, support systems, and equipment needed to control the expansion and manage the system.

2. Management, Organization and Systems

The preceding sections of this report clearly state the needs for a stable organizational structure, for delegation of authority, for better planning, for systems, for management information, for management development and for incentives and other motivations for management and supervisors. There is no need to reiterate them here. However, the lack of controls and effective administration is a major constraint to

managing expansion plans as well as on-going operations.

Immediate improvements are required and should be a prerequisite to proceeding with construction of additional facilities. Without the management and systems in place, the potential for the ineffective use of resources is greatly increased.

3. Staffing Needs for AGOSD Expansion Plans

The determination of the actual staffing needs of AGOSD is difficult for current operations as well as for future needs, because of a lack of quantitative data on work volumes, inadequate facilities and the very basic tools and equipment needed.

There are organizational units which are "overstaffed" while others are "understaffed". In general, there is a very low level of productivity and employees appear to be working only half the time or less.

AGOSD's Personnel Department, based on a survey, is predicting that the total headcount will rise from a current level of approximately 2000 employees to a level of 4000 in 1982 and further, to a level of 6000 in 1983.

Although these are projections, there is little justification for personnel increases approaching these levels. The facilities certainly are not expanding at a similar rate and the current level of staffing in most organizational units is higher than required. The addition of significant amounts of employees without effective supervision, systems, adequate work facilities, tools and

equipment would represent an ineffective use of human resources and cause a continuation of the current poor employee productivity levels.

The current operations and future expansion in the next two to four years should be handled with current levels of employment or with only a moderate increase in total employment. The priorities of personnel increases should be in the middle management, supervisory ranks and in obtaining experienced engineers. The lack of supervision and middle managers could significantly impact the effective management of expansion plans.

The approach should not be to hire more employees, but rather to improve employee productivity, through better supervision, efficient systems and procedures, better tools and more equipment.

4. Equipment Needs to Support Operations

There is a general lack of tools and of equipment and adequate maintenance of equipment throughout AGOSD. It is a major factor in properly maintaining the sewer system, a cause of low employee productivity and a constraint to managing an expanded sewer system.

A complete definition of equipment needs was not within the scope of this diagnostic review. However, every area covered in the review, both in administrative and in operational areas, we noted a need for additional tools and equipment. For example:

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- * Accounting has two calculators to be used by 36 people.
- * The typewriters in AGOSD are inoperative more often than they are operative.
- * Engineering lacks modern drafting tables, has no mechanical drafting arms or adequate storage facilities for drawings or a suitable work area.
- * The central vehicle repair garage is an "appalling" facility. With 160 vehicles to maintain they lack the very basic mechanics tools such as a "timing" light, spark plug gauges, and etc.
- * The Central Warehouse has no fork lift or other such equipment to move large or heavy warehouse items.
- * In sewer maintenance they need:
 - Additional pick-up trucks
 - Flushing trucks (jets)
 - Portable pumps
 - Bucket machines
 - Mobile rodding trucks
 - Backhoes

5. Summary of Analysis

AGOSD is now approaching a critical period in its development, and must consider a re-allocation of resources and an evaluation of their priorities. It may be necessary to make critical choices on the uses of funds and other resources, simply because it does not make sense to continue an expansion of a sewer system that cannot be properly maintained or managed. Of the capital budget, 650,000 LL is for trucks, cars, furniture, office supplies, tools and etc. This is obviously an area for re-evaluation. Additionally, the current expenses for other consumable tools should be evaluated and eventually increased.

Current budget is as follows:

| | <u>L.E.</u> | <u>% of the Budget</u> |
|---------------------|-------------|------------------------|
| 1. Salaries | 1.5 M | 8.5% |
| 2. Current Expenses | .6 M | 3.4% |
| 3. Capital Projects | 15.5 M | 88.1% |

It may well be in the long term best interest of everyone to curtail construction and re-allocate resources to developing the management capability, organizational stability, and acquiring the equipment required to effectively manage and maintain the systems.

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IX. ALTERNATIVE APPROACHES TO IMPLEMENTING CHANGE

The changes required to improve the management and control of AGOSD are sweeping in scope and will require a significant amount of effort to implement. Much of this effort will fall on the management and supervision of AGOSD, but it will also fall on outside consultants.

It is essential that before AGOSD launches a broad management improvement program, that consideration be given to the approaches to be used in the implementation process.

A. APPROACHES TO IMPLEMENTATION

The current situation at AGOSD, in our view, demands that improvements be implemented as soon as is practical, and that training be accomplished concurrently with implementation.

For this reason, we have rejected approaches that do not meet this basic requirement. The following approaches, or combination of them, are alternative methods of implementing changes. No approach can be successful without the active support of top management.

1. Live Case Study Approach

This approach, previously discussed in the Management, Supervision and Employee Training Section of this report, is a participative approach because it requires the active involvement of those directly affected by the changes.

The approach combines training and a joint effort in the design as well as the implementation of improvements.

The general steps in this approach are:

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- * Consultant develops the preliminary design of the organization or systems change.
- * Consultant presents design of objectives to be achieved to the management and supervision responsible and/or affected by the changes.
- * Consultant holds discussion with managers and supervision on the management concepts and techniques of control, involved in the change.
- * Management is given specific tasks to perform in developing the final design and documentation of changes.
- * Consultant reviews and guides the group to practical solutions that can be implemented.
- * Management presents completed projects to top management for approval and once approved, it communicates changes to subordinates and employees.
- * Consultant assists as required in the implementation of the improvements.

The advantage of this approach is that it is a joint effort, and managers feel that they are a "real" part of the process. They also feel that the new systems are their systems rather than something imposed on them. The results, in our experience, are that changes made in this way tend to be lasting and are not discontinued once the consultant has departed.

2. Traditional Consulting Approach

This approach is typical of the more traditional role of consultants and limits the participation of the managers in the process of developing solutions. The general steps involved in this approach are as follows:

- * Consultant develops preliminary design concepts for solution of the problem.
- * Consultant obtains general agreement from top management on the changes to be made.
- * Consultant completes the design including the procedures, systems documentation.
- * Consultant presents and discusses the design with the management and supervision involved.
- * Consultant presents report to management.
- * Management implements recommendations with the consultant rendering guidance required.

This approach requires knowledgeable and experienced management to be used successfully. Its advantages are that it is often faster than other approaches and allows the consultants to participate in more than one project at a time.

3. Internal Consulting Team - Managed by Outside Consultants

This approach is primarily designed to train a group of internal management consultants, while implementing organizational, systems and procedural changes.

Persons with a college degree in Business Administration, Accounting, Management or Finance could be trained to be effective internal systems consultants. The training is primarily on-the-job (OJT) under the direction of an experienced consultant.

The people selected for the team, are initially given brief training course in the basics of management, systems analysis techniques, information systems design, and in basic

human relations skills. After the training program, they are given specific assignments for systems projects to be accomplished under the direct supervision of an experienced management consultant. This group would form the nucleus of AGOSD's internal systems and methods group.

4. Shadow Organization

Assign senior, experienced consultants to each major department within AGOSD, with the authority and responsibility for accomplishing the mission of the unit as well as implementing organizational, systems and procedural changes. AGOSD's managers would have the opportunity to be trained in modern management concepts and techniques, while the process of improvements are being implemented.

There are of course, many factors to be considered in evaluating this approach including compliance with the law, the impact on the managers, the departments involved and also the human relationship aspects. This approach has been successfully applied in developing countries, in fact the development of the Middle East petroleum industry was achieved by a similar approach.

II. SUMMARY

Naturally combinations of the approaches discussed in this section could be used to implement improvements within AGOSD, depending upon the area of improvement and the AGOSD departments involved.

The assignment of priorities to implementation and the development of specific plans and schedules are the next tasks which should follow the acceptance of this report.

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APPENDIX A

GLOSSARY OF KEY TERMS

Chain of Command - The Chain of Command defines the linkage between organizational units. It identifies the reporting structure and the delegations of authority, responsibility, and the flow of instructions and other communication.

Cost Center - Typically associated with the concept of responsibility accounting, a cost center is an identifiable organizational unit for which costs can be separately accumulated. This is done for the purpose of controlling costs at the organizational unit level and for the evaluation of managers on how well they manage the resources allocated to their units.

Exception Reports - Exception Reports identify significant events that fall outside a predetermined criteria. These reports highlight potential problems or items that require management action.

Force Account - This is project work which normally would be performed by contractors, but which is done in house.

Management Information System - Integrated systems for the gathering, preparing and disseminating information used for management control and decision making.

Mission - A mission is a clear, concise statement of the role of an organization or organizational sub-unit. It is the reason for its existence.

Objectives - Objectives are the actions or events that the organization or organizational sub-unit should achieve in the effort to accomplish its mission. There may be specific, short term objectives and more general, long range objectives.

Policies - Policies are official statements used by an organization to guide activities and assure that they are performed in a consistent manner. They provide general guidelines which are to be used as a basis for decision making.

Procedures - The specific tasks that must be performed in the processing of specific systems. Although, such procedures may or may not be written, they generally define the interaction of systems resources.

System - A system is the integration of specific resources (i.e. manpower, equipment and financial resources) to perform specific procedures in order to accomplish defined objectives.