CHAPTER 3 A GENERAL OUTLINE OF THE TRAINING PROGRAM

3.1 Introduction

Any training program must be planned on the basis of the following considerations; 1) objectives of the training, 2) who is to be trained and what kind of organizational support can be obtained, 3) what type of training policies and methods should be used, 4) what kinds of training courses must be offered, and 5) how long the training program should be carried out. In the previous Chapters a brief explanation was already made on the first, second and the third points. The fourth and fifth points will be explained in this and the following Chapters.

3.2 Steps of Training Program Design

The steps which were taken in designing the training program are shown in Figure II.3: They are explained briefly below:

(1) Step 1: Identification of the SCA management's research and information needs for decision making and planning. This step was carried out through a field study of the Japanese Survey Team, conducted at the SCA in July~August 1978, in order to examine in detail the SCA management's needs for establishment of the Economic Unit.

(2) Step 2: Study of the organizational structure and functions of the Economic Unit. Based upon the findings derived from Step 1, Part I of this report was written concerning; 1) what kind of functions, tasks and jobs must be performed by the Economic Unit, 2) how they should be divided between the Economic Research and Systems Analysis Groups, 3) what kinds of research responsibilities should be assumed by each group, 4) what kind of technical knowledge and skills must be acquired by the Unit's staff members, and 5) other related problems of the Economic Unit.

(3) Step 3: According to the recommendations made in the preceding steps, the following considerations must be made; i.e., 1) how the organizational structure and functions of the Economic Unit will become fully operational, viz., problems of organization building (O/B) and organizational development (O/D), and 2) what are the specific training needs that must be fulfilled in the training program.

(4) Step 4: On the basis of the results of the preceding steps, a specific training program must be designed according to what kind of training curricula ought to be given during the technical cooperation period.

However, it must be kept in mind that, as mentioned in Section 2.1, the responsibility for the task of organization building rests primarily with the SCA, although the Japanese technical cooperation program will provide the SCA as much assistance and advice as possible. It is apparent that any training program must be effectively linked and synchronized with the purpose of organization building. Consequently, the training program must be designed in such a way that the purpose of the organization building will be achieved. There are variety of theories and practical methods which have already been developed by experts of administrative science as to how

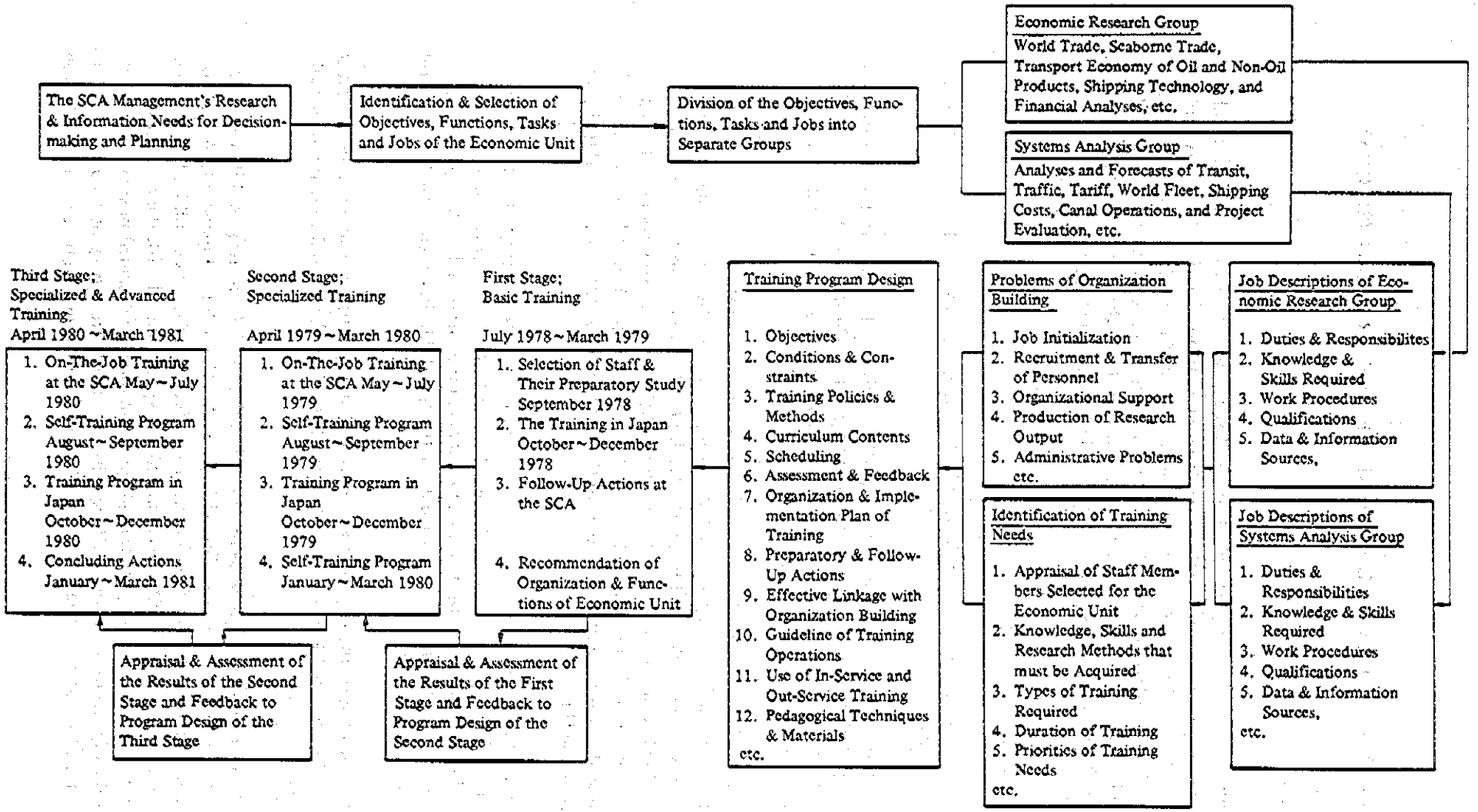


Fig. II.3 Steps for the Technical Cooperation Program Design

personnel training should facilitate organization building and development. Since a large amount of literature has been published on what kind of role must be played by personnel training programs for the purpose of organization building, detailed explanations are left out of this paper. It is suggested that interested readers should consult with the literature listed in Appendix IV.

In addition, it should be noted that if organizational development of the Economic Unit could be divided into three developmental stages; i.e., "birth," "youth," and "maturity," which will have specific concerns and key issues corresponding to each stage, our primary attention and efforts will be limited to the attempt to resolve the problems of the "birth" period of the Economic Unit (see Table II.2). The remaining problems associated with the Economic Unit's "youth" and "maturity" periods must be tackled by the Economic Unit itself.

Table II.2 Stages of Organizational Development of the Economic Unit

Developmental Stages	Critical Concern	Key Issues
Birth	1. To create the Economic Unit within the SCA	1. The SCA's organizational support; 2. Recruitment of qualified Staff; 3. Training of Staff; 4. Initialization of Work;
	2. To survive as a viable system	1. Budgetary and organizational input is effectively mobilized. 2. Research output is produced as planned meeting pre-established standards and objectives 3. Necessary corrective actions should be promptly made.
Youth	3. To gain stability	1. Research activities continue without interruption. 2. Research organization management becomes routinized. 3. Research productivity increases.
	4. To gain reputation and develop pride	1. Tangible contribution will be made to the SCA's management goals. 2. Organizational capabilities will be improved through recruitment of qualified personnel. 3. Benefit of research output is well recognized within the SCA.
Maturity	5. To achieve uniqueness and adaptability	1. Adaptability of changing requirements will be attained. 2. The Economic Unit will become an indispensable part of the SCA's management system. 3. Reliability of the Economic Unit's work will become unquestioned.
	6. To contribute to the SCA's goals	Major contributions will be made to the SCA's critical decision problems; e.g., assessment of feasibility study of projects, tariff policy, revenue forecasting, financial analysis of the SCA's operations, etc.

3.3 Economic Unit's Research Functions and Training Needs

(1) Economic Unit's Research Functions

As noted in Part I, the Economic Unit's primary objectives or functions are to supply necessary information to the SCA's management so that rational and/or optimal decisions and planning will be made by the SCA's management in the future. In this sense the chief roles of the staff members of the Unit are to act as "information supplier," "staff specialist," "in-house consultant," "intellectual brains," "in-house think-tank" and so forth on matters concerning the SCA's management decision-making and planning problems. However, the problem-areas with which they have to deal are broad in range and diverse in their aspects. These problems could be classified into the following categories:

(1) External problems; such as trends of international economics and trade, demand and supply patterns of energy and other primary resources, fluctuations in sea-borne trade and freight rates, technological changes in shipping and transportation, etc. These problems are environmental factors of the SCA and cannot be directly controlled by the SCA.

(2) Internal problems; such as tariff structure, transit capacity of the Suez Canal, convoy system, operating efficiency of the SCA's activities and their cost-effectiveness, revenue and profit structure, etc. These factors are under the SCA's direct control, and the SCA's management could take policy measures concerning them.

(3) Long-term planning problems; such as strategic planning of "Canal expansion project," diversification policy of the SCA's operations, capital investment plans and projects, etc.

(4) Short-term planning problems; such as an annual revenue plan, operating budget plan, sales promotion and other marketing plans, procurement and inventory plan, manpower plan, etc.

It is of course considered ideal that the Economic Unit will eventually become a professional research and planning unit, in that all of SCA's decision-making and planning problems are analyzed in depth and that rational and optimal policy recommendations will be made to the SCA's management. However, it will be unrealistic to expect that the staff members of the Economic Unit will be able to attain a high degree of intellectual and technical proficiency in tackling all of these problems within a short period of time. It must be regarded rare even in Europe or the U.S.A., or in Japan, that a single professional research and consulting organization is sufficiently equipped with high intellectual capabilities so as to be able to deal with all of these problems.

As already explained in Part I, the Economic Unit's research and information analysis functions can be classified into five basic categories; they are; 1) transit analysis and forecasting, 2) tariff studies, 3) project evaluation, 4) financial analysis and 5) analysis of the SCA Canal operations. These research and information function areas could in turn be subdivided into smaller work elements such as world economy and trade, energy supply and demand, seaborne trade flows of oil and non-oil products, origins and destinations of commodities relevant to the Suez Canal, etc.

A systematic view of how these problems are interrelated to each other is shown in Figure II.4: Research and Information Analysis Areas of the Economic Unit. However, it must be remem-

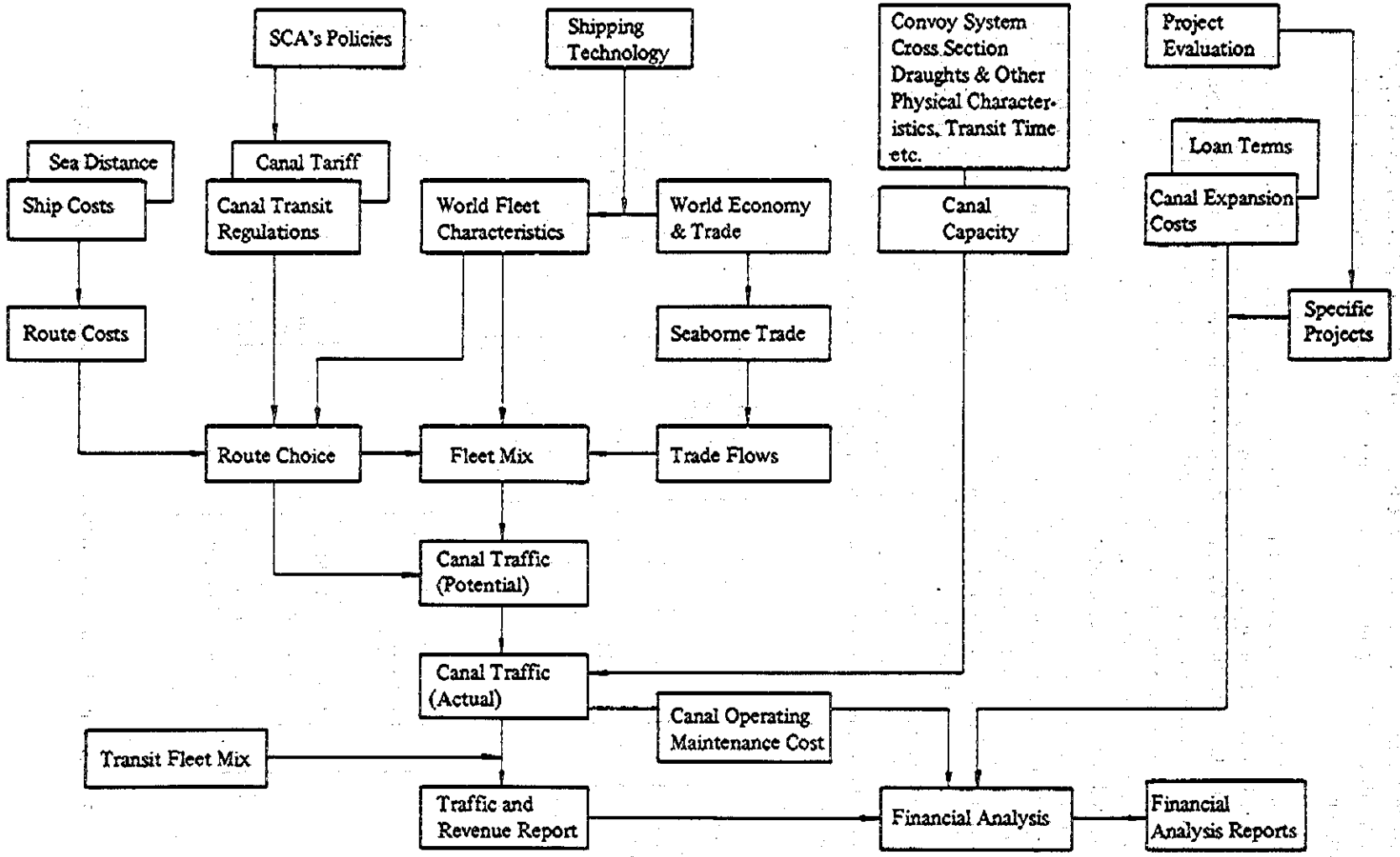


Fig. II.4 Research and Information Analysis Areas of the Economic Unit

bered that a system of the problems could be subdivided into various sub-systems of smaller or lower level problems, and what is shown in the Figure should be viewed as a representative sample of the technical fields upon which focus should be placed in the present technical co-operation program.

It should be apparent that the Economic Unit's research and information analysis functions must be performed so as to directly contribute to the SCA management planning and decision making on matters relating to the SCA's internal and external, long and short-term problems. Obviously, the type of the Economic Unit's activities required for achieving this task will vary greatly depending upon what kinds of SCA management decision and planning problems are requested to be studied. The kinds of management planning activities and the types of research activities associated with the management decision making process are shown in Appendix V (a), (b). In the most general terms, how the information necessary for achieving these objectives is to be collected and processed is shown in Figure II.5: SCA Management Information and Research Needs and Functions of the Economic Unit and Figure II.6: The Research Information Processing Flow of the Economic Unit. It was already explained in Chapter 3 of Part I, what are the Economic Unit's research and information analysis functions and how their functions are to be carried out. However, it must be noted that since detailed explanations will be provided to the SCA participants in the training program as to the work procedures of respective information and research tasks, the present paper describes very little of the work procedures of individual work tasks.

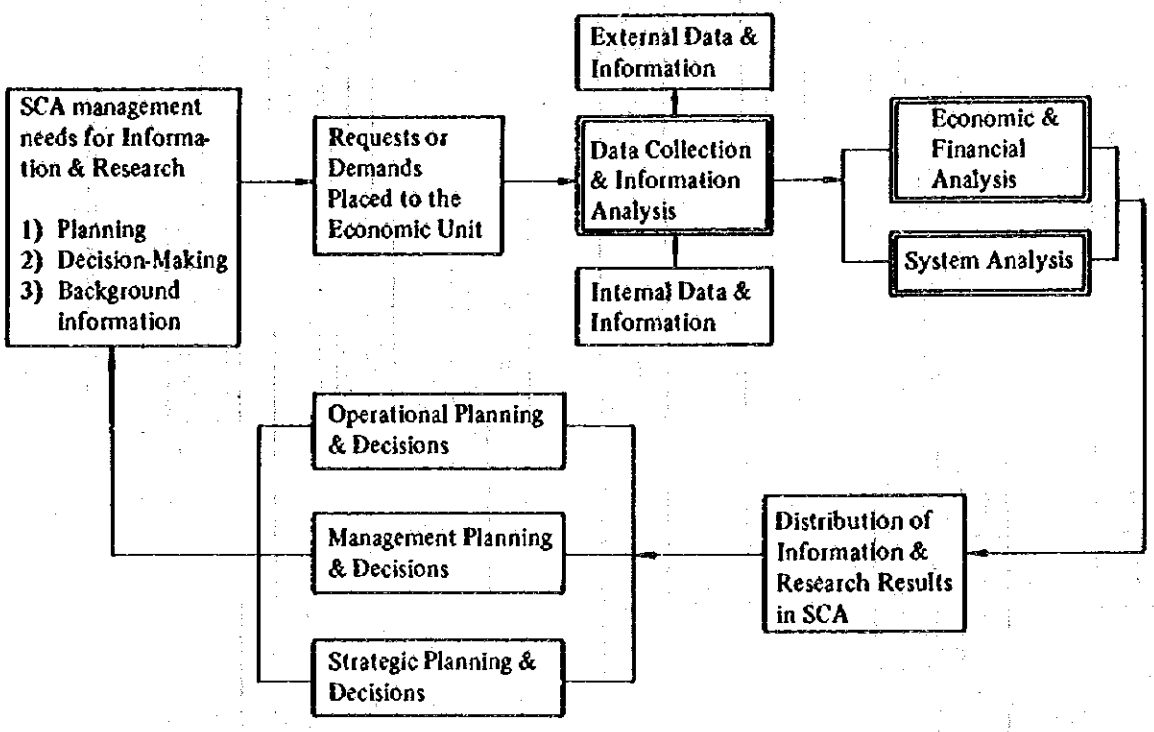


Fig. II.5 SCA Management Information and Research Needs and Functions of the Economic Unit

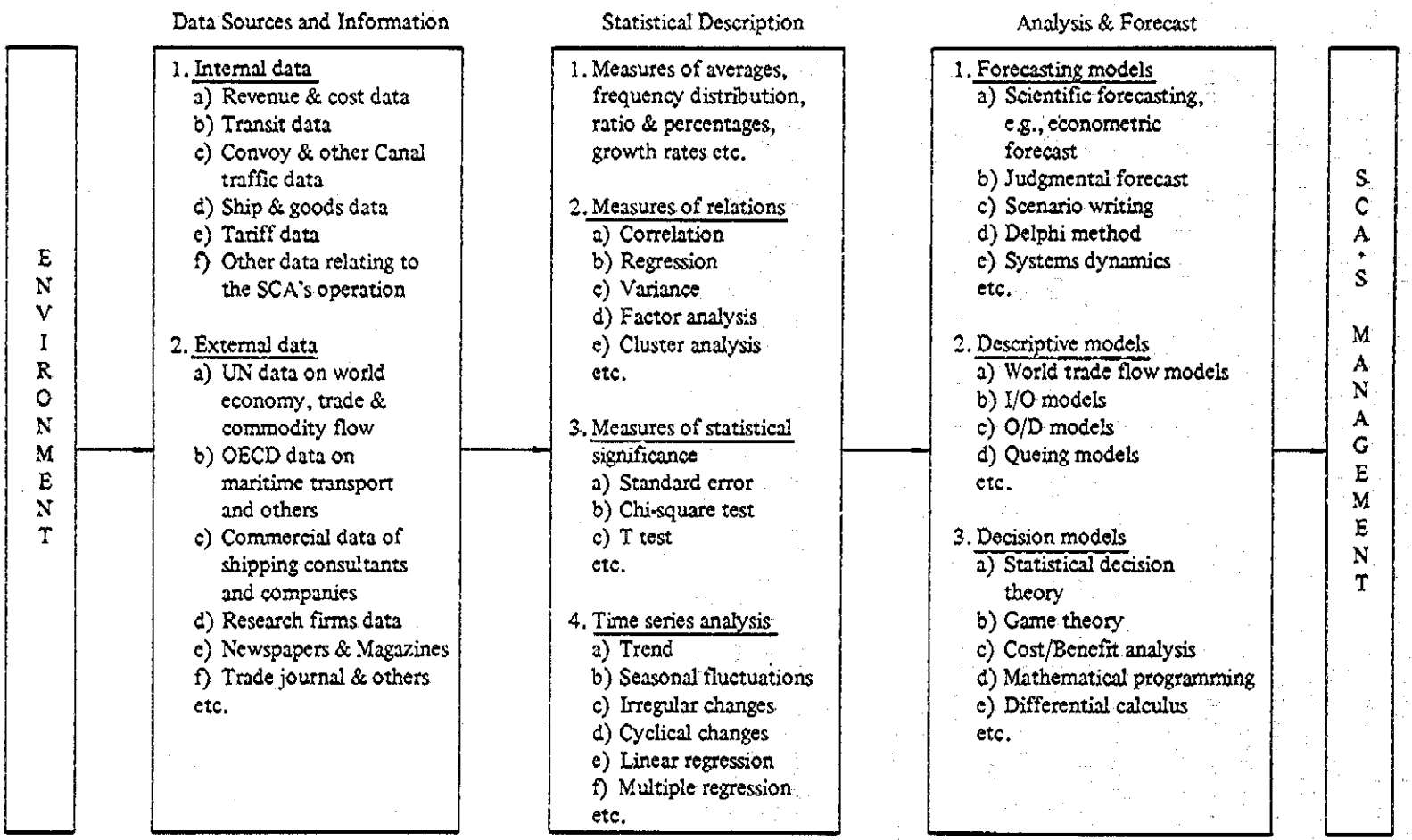


Fig. II.6 The Research Information Processing Flow of the Economic Unit

(2) Training Needs of Staff Members of the Economic Unit

Although primary emphasis must be placed upon the learning process of the technical problems directly facing the SCA, relying mainly upon a problem-solving and inter-disciplinary approach, it is undeniable that formal training in various theories and concepts of international economy and trade, correct understanding of the problems to be analyzed in maritime transport, of Canal operations, and of project evaluation, etc. are indispensable. In view of the importance attached to the theoretical knowledge and ability to think in a conceptual frame of reference, the present technical cooperation program ought to be designed in such a way that theory and methodology learning courses will go hand in hand with problem exercises and application problems.

At the same time staff members of the Economic Unit must become aware of the specific roles to be played either as a member of the Economic Research Group or as a member of the Systems Analysis Group. It must be noted that economic researchers and system analysts must first and foremost be information analysts. This is so because the chief input or materials they will work on are data and information relating to SCA operations so that they must acquire professional proficiency in how to collect, process and summarize the data and information relating to SCA operations. The specific abilities necessary for staff members of the Economic Unit such as being an economic researcher, systems analyst and information analyst are briefly indicated in Figure II.7.

As explained in Part I, it is assumed that different types of training must be offered to the staff members who will be assigned to the Economic Research Group or the Systems Analysis Group because it is intended that they will perform different kinds of research functions. Their respective research roles are summarized to reiterate what was explained in Part I.

Specific Abilities;
1. Economic Researcher
2. Systems Analyst
3. Information Analyst

Economic Researcher:

1. Identification and formulation of problems and issues relevant to decision making and planning of SCA.
2. Collection of necessary data and information that are to be statistically described.
3. Analysis of the data and information within a theoretical frame of reference which is relevant to the problem under study.
4. Ability to judge and evaluate the results of analysis in terms of certain criteria and/or concrete management needs of SCA.
5. Ability to summarize the conclusions of research in such a way that the SCA's management could initiate necessary actions upon them.
6. Ability to make necessary recommendations as to how strategic, tactical and operational decisions could be made by the SCA's management.
7. Ability to present orally and/or in written form problems of research activities and their conclusions.

Systems Analyst:

1. Ability to identify and formulate the problems in terms of systems context; i.e., total system, sub-systems, interrelations and interfaces between sub-systems, feedback mechanism, etc.
2. Ability to analyze problems by quantitiative methods and to use problem-solving approaches.
3. Ability to judge and evaluate the SCA's operations and projects or programs in terms of cost/benefit framework.
4. Ability to forecast future events by means of mathematical and/or statistical tools.
5. In particular, ability to "system analyze" tariff structure, transit volume, convoy system and other SCA problems and forecast their future state of affairs.

Information Analyst:

1. Ability to collect primary and secondary data and information within and without the SCA that are crucial to the SCA's decision-making and planning activities.
2. Ability to store and file necessary data and information in a systematic way so that they could be used for study purpose immediately upon request.
3. Ability to summarize the data in such a way that the issues at hand are made easily understandable.
4. Ability to organize data and information to enable readers to easily understand trends, correlation of various factors, and distribution patterns of elements etc.
5. Ability to write up short analysis reports on problems.
6. Ability to upgrade information management system to facilitate the decision making process of the SCA.

Fig. II.7 Specific Abilities Necessary for Staff Members of the Economic Unit

1) Economic Research Group

The staff members are concerned mainly with economic, financial and technological trends and/or problems of the SCA. It is intended that this group will write summary reports on such topics as trends of world economy and trade (e.g., economic trends of OECD countries, etc.), demand and supply trends of oil and oil products and of general dry cargoes, changes in freight rates and other maritime transport problems relevant to the SCA, trends

in shipbuilding technology, etc. Their analysis is intended to be less intensive and quantitative, just to meet the purpose of keeping the SCA management informed of current developments in the SCA's external problems and internal operations.

2) System Analysis Group
On the other hand, staff members of the Systems Analysis Group are charged with the responsibilities of engaging in quantitative analysis and forecasts of Canal transit volume, project evaluation, cost analysis of the SCA's Canal operations, development of computer programs and software packages to be used in analysis and forecasts of technical problems, and other selected problems which require sophisticated mathematical and statistical analysis. Their main task is to analyze and evaluate the problems in depth, and to formulate alternative solutions for the SCA management. They will, on a periodical basis, produce a series of short- and long-term forecasts of transit volume, revenues, and other problems. In addition, upon request they will work on selected topics of SCA management problems and will make policy recommendations.

Despite the fact that they were divided into two groups within the Economic Unit, as separate sections dealing with different tasks and missions; i.e., the Economic Research Group is concerned with economic, financial, and technological problems and on the other hand the Systems Analysis Group is to apply systems analysis methodology, the problems they have to work on basically belong to the same kind of broad functional areas of the SCA as mentioned before. As a result all of their research functions areas are directly or indirectly related to one of the following problems areas; i.e., 1) transit analysis and forecast, 2) tariff studies, 3) project evaluation, 4) financial analysis and 5) analysis of the SCA Canal operations.

It is suggested that during the initial few years they will work jointly as much as possible on selected research programs or projects which are judged of considerable importance for the SCA. The reasons are as follows;

1) The staff members will become able to complement each others lack of ability.

2) They will be given the opportunity to learn how to carry out a research program or project jointly.

3) Their learning process will be expedited through mutual exposure to research problems that must be handled as a researcher and analyst.

4) The quality of their research output will be improved through their joint efforts.

The kind of research areas which are to be considered as the major tasks of the Economic Unit, are shown in Table II.3, and also shown are what kind of specific subjects or elements and items are to be studied, and what kind of training must be conducted for the staff members of the Economic Unit. However, it must be understood that all of the technical fields suggested for the training of staff members will not be covered in the present technical cooperation program and these fields should also be learned individually in self-training programs or efforts.

Table II.3 Research Function Areas of the Economic Unit and Suggested Fields of Training for Its Staff Members

Major Research Areas of the Economic Unit	Subjects, Elements or Items to be Studied	Fields of Training Suggested for Its Staff Members	
		Disciplines & Subject Matters	Special Skills & Methods
Transit Analysis and Forecast	1. World Economy and Trade 2. Seaborne Trade Flows 3. World Fleet Characteristics 4. Origins/Destinations of Commodities 5. Shipping Costs 6. Route Costs 7. Shipping Technology etc.	1. International Economics and Trade 2. Maritime Transportation Economics 3. Applied Mathematics (O.R. & Mathematical Economics) 4. Econometrics or Economic Statistics 5. World Energy Demand and Supply 6. Computer Programming 7. Maritime Transport Planning 8. Managerial Economics 9. Shipping Market Analysis of Tramp, Tanker and Liner Shipping, etc.	1. Data Collection and Processing of Maritime Transport Statistics 2. Forecasting Techniques 3. Commodity Flow Analysis and Forecast of Oil & Non-Oil Products 4. O/D Matrix Analysis 5. Simulation Techniques 6. Systems Analysis Methods etc.
Tariff Studies	1. Review of Canal Tariff Policies 2. Changes in Revenues by Ship Type and Size, by Commodity and by Loading Conditions 3. Validity of Tariff Level Against Route Costs 4. Rate of Inflation of World Economy 5. Effects of Tariff Changes Upon Transit Volume, etc.	1. Managerial Economics 2. Managerial Accounting 3. Maritime Transport Economics 4. Business Mathematics & Statistics etc.	1 Maritime Transport Data Collection Analysis and Forecasting Methods 2. Management Science Techniques, e.g., Decision Making Theories 3. Optimization Techniques 4. Cost Analysis Techniques etc.
Project Evaluation	1. The Long and Medium Term Projects Evaluation 2. Identification of Various Aspects of a Project; Technical, Economic Commercial, Financial, Managerial and Organizational Aspects, etc.	1. Cost/Benefit Analysis 2. Managerial Economics 3. Mathematical Economics and Business Statistics 4. International and Macro-Economics 5. Managerial Accounting, etc.	1. Same Techniques and Methods Mentioned Above 2. Financial & Economic Analysis Methods 3. Sensitivity Analysis etc.
Financial Analysis	1. The SCA's Revenues and Expenditures 2. Financial Situations of Major Countries 3. Financial Status of Shipping Companies 4. Shipping Costs, Canal Operational Costs, Project Costs and Other Costs Analysis etc.	1. Managerial Accounting 2. Managerial Economics 3. Maritime Transport Economics 4. Business Mathematics and Statistics etc.	1. Various Types of Costs Analysis Techniques 2. The Balance Sheet, Income Statement Analysis and Other Financial Analysis Techniques 3. Break-Even Point Analysis, Present Net Value, Cost/Benefit Ratio Analysis, etc.
Analysis of the SCA Canal Operations	1. Canal Capacity (Convoy System, Physical Layout of Cross-Section, By-Passes, Transit Rules, etc.) 2. Arrival Patterns, Waiting Time, Congestion, Accidents, etc.	1. Applied Mathematics and Statistics 2. Computer Programming 3. Simulation Theory 4. Management Science or O.R.	1. Comparative Capacity Analysis 2 Simulation Techniques 3. Transit Diagram Analysis

3.4 Training Program Plan

In view of the considerations given in the preceding sections, the training curriculum is planned to be divided into four groups; 1) those which must be commonly taken by all members of the Economic Unit, 2) special curricula that will be designed for the specific requirements of the Economic Research Group, 3) quantitative methodology oriented curricula which will be geared to the needs of the Systems Analysis Group, and 4) research management curricula that are specially designed for managers of the Economic Unit. The curriculum contents of these four training programs will be briefly explained below.

(1) Basic and Common Curriculum Program

There should be a basic and common training curriculum that must be taught to all members of the Economic Unit. This basic training program serves the purposes that; 1) a full understanding will be reached among the staff members with regard to the nature and types of the research jobs which must be undertaken by the Economic Unit; 2) the member must be made familiar with basic theories and methodologies that will be used to analyze internal and external policy problems of the SCA; 3) basic knowledge and skills must be acquired by the staff members as to how the Economic Unit's research work must be carried out. To meet these goals, the following curricula are planned to be offered to the SCA's participants in the first year.

1) Basic knowledge of maritime transport problems and statistics
2) Elementary statistical data analysis methods
3) Theories and methodologies of maritime transport economy
4) Analysis and forecast methods of the SCA problems, e.g., Canal transit and project evaluation
5) Research methods and procedures

(2) Special Curricula for the Economic Research Group

In order to assist the future members of the Economic Research Group to acquire knowledge and skills necessary for undertaking research work on the SCA's economic and financial problems, the following special training courses must be covered in the training program as well as in the members' self-study at the SCA.

1) International economics and trade analysis
2) Maritime transport economics
3) Managerial economics
4) Managerial accounting
5) Introductory econometrics or mathematical economics and statistics

(3) Special Curricula for Systems Analysis Group

The Systems Analysis Group is planned to assume the responsibility of undertaking quantitative analyses of the SCA's planning and decision making problems by means of a systems analysis approach and it should be regarded as a core research group of the Economic Unit. Intensive training must be given to this group's members on the following disciplines in addition to some of those listed in the preceding paragraph, (2):

1) Mathematics and statistics
2) Systems analysis

3) Management science & operations research
4) Computer science
5) Forecasting methods
6) Cost/benefit analysis and other quantitative methods of project evaluation and problem-solving

(4) Special Curricula for Research Organization Management

Special curricula must be given, though less intensively, to senior staff members of the Economic Unit so that the Economic Unit as a research organization will be effectively managed and research projects and programs be efficiently planned and controlled.

1) Business research methods
2) Management theory and practice of research organization
3) Introductory management science

CHAPTER 4 A THREE YEAR TRAINING SCHEDULE PLAN

4.1 Introduction

As pointed out before, the technical cooperation program consists of two main parts; one is technical training program which will be conducted in Japan for the Economic Unit's staff members; and the other is an on-the-job training program that will be conducted by the Japanese consultants and experts at the SCA. As a whole, the cooperation program is planned to continue for three years. However, the duration of the training program in Japan as well as at the SCA will be determined by taking into consideration the curriculum requirements, educational level and technical capabilities of the SCA participants, other considerations that must be given by the JICA, and other pertinent factors.

It must be kept in mind that, as frequently mentioned before, a detailed training curriculum plan for each stage will be decided only after the JICA mission has concluded an agreement with the Suez Canal Authority on matters concerning the contents of the technical cooperation program for the following year. Therefore what is provided in this Chapter should be interpreted as a general training schedule plan, according to which detailed training curricula will be designed later at each stage of the technical cooperation program.

4.2 An Outline of the Training Cycle

In the previous Chapters, a summary description was given on the basic framework of the technical cooperation program such as the objectives, methods, technical fields, disciplines and subject matters, planned three year schedule and research output. The explanations made on these items would suffice to explain the nature and type of the technical cooperation program that will be extended to the SCA by the JICA. As indicated there, the present cooperation program consists of the following main activity phases:

(1) Technical training program executed in Japan for the period of three months in the first year and for the period of the required length in the succeeding years.

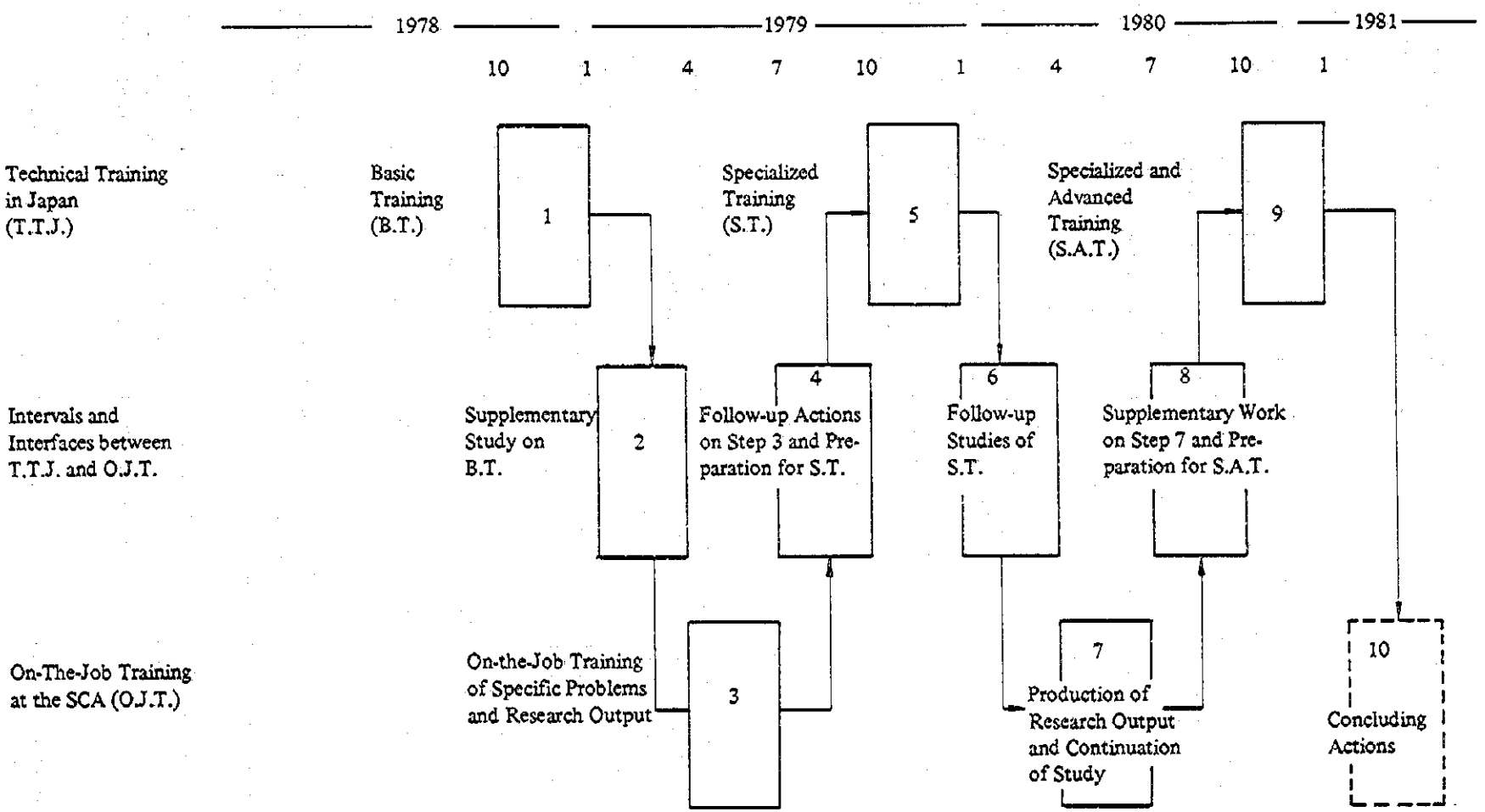
(2) On-the-job training of the Economic Unit's staff members at the SCA for the period of necessary length in 1979 and 1980.

(3) Follow-up actions and self-training program for the preceding training program and preparatory work for the succeeding program during the interval between TTP (Technical Training Program) and OJT (On-the-Job Training).

Schematic relations between these component activities are summarized in Table II.4: Schematic Relations of Component Activities. As indicated in this Table, the present technical cooperation program is comprised of ten activity phases or steps, which are briefly explained below:

Step 1: Basic technical training in Japan which was carried out from October to December 1978.

Table II.4 Schematic Relations of Component Activities



Step 2: Follow-up study and actions on Step 1 and preparatory work for Step 3. This activity step consists of assignments to supplement the studies made in Step 1 and necessary preparatory work required for Step 3.

Step 3: It is planned that training programs on specific problems will be given to the trainees and, at the same time, they will start producing research output with assistance of the Japanese consultants.

Step 4: It is planned that supplementary studies will be made by the trainees on Step 3 and assignments will be given to prepare for the specialized training of Step 5.

Step 5: It is planned that specialized training programs will be designed by taking into account the specific training needs of staff members of the Economic Research and Systems Analysis Groups, new recruits and senior members of the Economic Unit.

Step 6: It is planned that a supplementary and follow-up study program will be provided on Step 5, because Step 5 is expected to be very specialized requiring continuous studies.

Step 7: It is planned that the quality of the research output will be upgraded to meet the information requirements of the SCA.

Step 8: It is planned that while supplementary work is being done on Step 7, a set of assignments will be given to the Economic Unit's staff members to prepare themselves for a specialized and advanced training program in Japan during the next step.

Step 9: It is planned that this step will be a final training program which will be conducted in Japan and it will be specialized and advanced.

Step 10: It is planned that conclusive actions will be carried out to finalize the present technical cooperation program.

However, it must be remembered that these are the steps which are drawn up from the limited vantage point of our present knowledge, findings of the SCA's conditions and technical capabilities of the trainees who were already undergoing the training process in Japan, and that the nature and activity contents of some of the steps might be adjusted in the future in order to meet changing requirements of the SCA and the JICA.

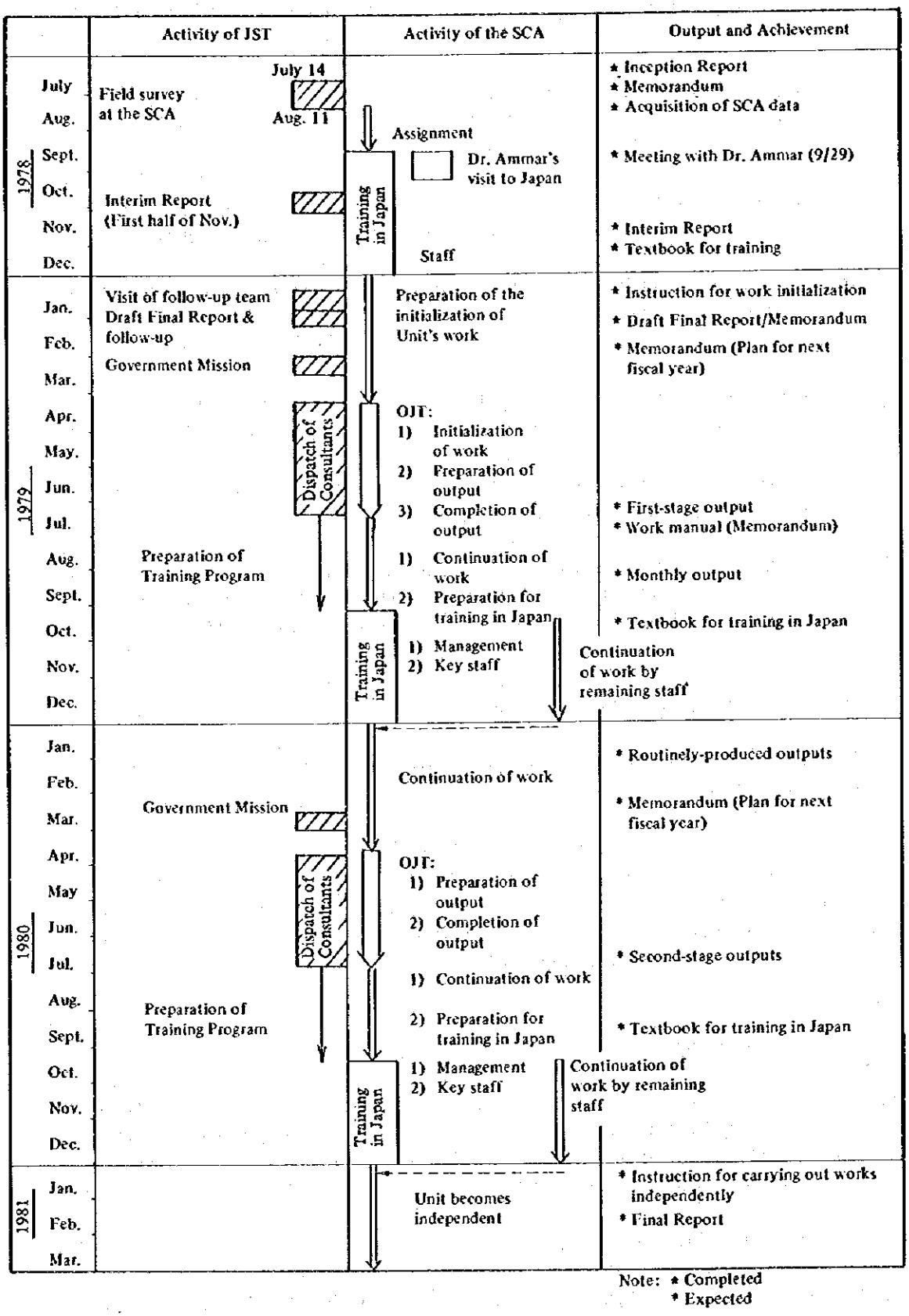
4.3 Tentative Three Year Schedule

A tentative three year schedule is shown in Table II.5. The first column lists the activity of the JST (the Japanese Survey Team), the second column indicates the activity of the SCA and the third column notes what kinds of specific output will be expected. The schedule is basically drawn up according to the following principles and assumptions.

(1) As for the activities of the JST, it is planned that;

1) The Japanese consultants and experts will be dispatched to the SCA during the coopera-

Table II.5 Tentative Three Year Schedule of JTCP



tion period to engage in on-the-job training in Ismailia, and the consulting work will last for three months from April (or May) to June (or July).

2) The Japanese Government Mission will be sent to the SCA in March to discuss the detailed programs of the following year with top SCA officials, and to formalize the mutual agreements that will be reached between the two parties.

(2) With regard to the activities for and at the SCA, it is planned that;

1) Technical training courses will be given to the trainees in Japan for the period of about three months from October to December.

2) On-the-job training will be given to the staff members at the SCA to assure that the Economic Unit's job will become operational. This will be done by the Japanese consultants and experts who will be sent to the SCA as mentioned in (1), 1).

3) During the interval period between the training in Japan and on-the-job training at the SCA various preparatory work and other necessary self-training will be done.

4) Research output will be produced at the end of each of the on-the-job training sessions at the SCA.

(3) As regards output that will be produced at various phases of the cooperation program; the following are planned to be produced;

1) Training textbooks to be used in Japan as well as at the SCA.

2) Memoranda to be exchanged to confirm the agreements.

3) Research output produced by the staff members of the Economic Unit, if necessary with assistance of the Japanese consultants.

However, as frequently mentioned before, it must be understood that the schedule mentioned in this section is a tentative one and by no means fixed, and that it will be subject to change due to justifiable reasons in the future.

4.4 Three Training Stages

As previously explained, the proposed training program is planned to continue for three years which is divided into three main stages or phases. The training programs of these stages should be explained in the following.

(1) Three Stages

As shown in Figure II.8, at the first stage basic training will be given centered upon the basic and common curriculum program. The objective of the first year is to make the participants familiar with basic problems, terminologies and concepts, methods and other related problems

1st Year (July 1978~March 1979)

Basic Training

Basic Knowledge of Maritime Transport
- Shipping and its Terminology;
- World Economy & Sea-borne Trade;
- Energy Problems; Tramp & Liner Shipping;
- Maritime Transport Cost and Maritime Data and Reports etc.

Basic Methodology & Analysis Techniques
- Elementary Mathematics
- Elementary Statistics
- Introductory Computer Programming

Theory & Analysis of Maritime Problems
- Managerial Economics & Concept of Planning, System Analysis of World Economy & Sea-borne Trade, Transit Analysis by Goods, Ships and Convoy System

Forecasting & Problem-Solving of Suez Canal Problems
- World Economy & Trade
- Forecasting Method (Tankers)
- Forecasting Method (Non-Tankers)
- Convoy Systems & Project Evaluation

Management Problems of Research Organization
- Planning & Control of Research Activities
- SCA's Planning and Management Decisions and Information Requirements etc.

2nd Year (April 1979~March 1980)

Specialized Training

Economic Research
1. Theory & Method: International Economics & Trade, Sea-borne Trade & Maritime Economics, Mathematical Economics, Economic Statistics, etc.
2. Problem Analysis: Economic Analysis of Selected Proclems of Maritime Trade and Transportation, Canal Transit; Short Analysis Reports, etc.

Systems Analyst
1. Theory & Method: Systems Analysis, OR Theory & Method, Econometrics & Statistics, Management Science, C/B Analysis & Other Quantitative Analysis, etc.
2. Problem Analysis: Forecasting Analysis of Canal Transit & Revenue (Short-Term), Evaluation Methods of Project and Feasibility Study, etc.

Management of the Economic Unit
1. Theory & Method: Theory and Method of Research Organization Management, Planning and Control of Research Work, Management Science, etc.
2. Problem Analysis: Administrative Problems of Research Work, Project Formation, Planning and Budgetary Control, Inter- and Intra-Organizational Relations, etc.

3rd Year (April 1980~March 1981)

Specialized & Advanced Training

Economic Research
1. Theory & Method: International Economics, Trade & Commodity Study, World Demand & Supply of Energy, Econometrics, Managerial Economics and Cost Analysis, etd.
2. Problem Analysis: Forecasting Analysis of Maritime Economics & Transport, etc.

Systems Analyst
1. Theory & Method: Systems Theory (II), OR Theory & Method (II), Econometrics (II), Management Science (II) and Other Quantitative Analysis etc.
2. Problem Analysis: Long-Term Forecasting Analysis of Canal Transit, Cargoes, etc. Case Study of Project Evaluation, Sytems Analysis of Selected Topics, Evaluation of Feasibility Study, etc.

Management of the Economic Unit
1. Theory & Method: Management Theory & Practice of Decision Making and Planning, Management Science (II), Information Management, etc.
2. Problem Analysis: Selected Topics of Strategy and Tactics of Research & Planning, Human Relations Problems, Management Accounting, etc.

Fig. II.8 General Framework of Three Years Training Program

which are indispensable for correct understanding of the SCA's problems. At the second stage, the curriculum contents will become specialized into three fields; viz., Economic Research, Systems Analysis, and Management of the Economic Unit. In the third stage, the curriculum will not only become specialized, but also advanced in the respective fields of training, and it will become geared more towards attainment of specific research requirements of the Economic Unit.

(2) Basic Principles of Training Stages

The three training stages will be organized by the following actions;

1) Definition of the training objectives
2) Training curriculum design and organization
3) Preparation of the textbooks
4) Evaluation of the participants' performance and achievement
5) Assignments for the self-training program

However it must be noted that detailed curriculum design cannot be made at this stage for the second and third stages due to the many uncertainties involved i.e., uncertainties about the participants' level of technical knowledge and skills, level of productivity and appropriate amount of workload and the organizational support of the SCA. Because of this, a detailed explanation will be made only on the first year training program in the following Chapters.

Nevertheless the following must be noted as basic principles of the training stages.

1) Staff members of the Economic Unit who were already recruited in the first year will be thought of as becoming a core group of the Unit, and they will go through a three year or stage training program.

2) It is imperative that the participants who will be newly recruited in the succeeding years must be well qualified to participate in the on-going training process. If they are judged not qualified, they must go through an accelerated and intensive training program on a very accelerated schedule.

3) It is planned that those who will join the Economic Unit in the second and third year will be provided the same textbooks prepared for the core group.

These principles are shown briefly in Table II.6.

Table II.6 Basic Principles of Training Steps

Training Stages / Staff Members	Training of the First Year (July 1978~March 1979)	Training of the Second Year (April 1979~March 1980)	Training of the Third Year (April 1980~March 1981)
Staff Members Recruited in the First Year	Basic Training (B.T.)	Specialized Training (S.T.) 1. Economic Reearch 2. Systems Analysis 3. Management	Specialized & Advanced Training (S.A.T.) 1. Economic Research 2. Systems Analysis 3. Management
Staff Members Recruited in the Second Year		(guidance) If Not Qualified ——— B.T. If Qualified ——— S.T.	(guidance) Accelerated Training of S.T. and S.A.D. S.A.T.
Staff Members Recruited in the Third Year			(guidance) If not Qualified ——— Accelerated B.T. and S.T. If Qualified ——— S.A.T.

Note: B.T., S.T., S.A.D., represent Basic Training, Specialized Training, and Specialized and Advanced Training respectively.

CHAPTER 5 AN OUTLINE OF THE FIRST YEAR TRAINING PROGRAM IN JAPAN

5.1 General Objectives

The training program in Japan (October~ December 1978) marks the beginning of the three year technical cooperation program offered to the SCA by the Japan International Cooperation Agency (JICA) on behalf of the Japanese Government. It was designed to serve the following general objectives;

(1) Acquisition of, and familiarity with, basic knowledge, technical skills and methodologies as are required for the research work of the Economic Unit.

(2) Establishment of a common framework of the Economic Unit so that the SCA's participants will be able to have shared goals, job requirements, and a sense of responsibility so to become a professional research group of the SCA.

(3) Evaluation of the participants' capabilities, level of previous training, and aptitude as a researcher on the basis of which the level and contents of the training program for the succeeding stages will be planned.

In order to achieve these objectives the training curricula of the first year in Japan were programmed according to the following principles;

(1) All of the trainees will become exposed to a variety of research tasks, methodologies, theories and concepts, statistical data, problem areas, etc., all of which will be covered in depth in the remaining years of the training.

(2) All of the training programs will be conducted at an introductory level and within the limited time of three months, so that the participants will become sensitized and introduced to all of the research problems that will face the Economic Unit in the future.

(3) A series of problem exercises will be given to the participants so that their general capabilities and potentials can be accurately assessed and a tentative judgment can be made about their aptitude, either for the Economic Research Group or the Systems Analysis Group. Group.

Participants might have felt that the first year training program was too intensive to fully absorb and understand what was taught, as it covered a wide variety of subjects within the limited time span of three months. However, it was not intended that the participants should comprehend all of the curricula in depth. It must be kept in mind that they will be given enough time at the SCA to review and supplement what they learnt in Japan during the period of January~ March 1979.

5.2 Specific Training Curriculum Plan

The first year's SCA's participants were diverse in their educational level, previous experience at

the SCA, subject of their speciality and age. In order to achieve the general objectives set forth in the previous section, while incorporating their respective needs and requirements into the training program, the following training curriculum plan was programmed;

(1) Introductory course of maritime transportation problems in which all of the world seaborne trade and maritime transport problems relevant to the SCA will be discussed and the basic concepts and terminologies are explained.

(2) Statistical data analysis course in which elementary mathematics, statistics, and computer programming are explained.

(3) A training course in which basic theories, concepts and methods of international economy and seaborne trade, transit analysis and managerial economics will be discussed.

(4) A course in which basic methods of transit forecast and project evaluation will be explained in their relation to the SCA's concrete problems.

(5) A course in which business research methods and procedures will be explained.

The training program of the first stage thus consisted of these five curricula, but they were preceded by an orientation course in which an outline and instructions were given to the participants concerning how these courses were to be carried out during the period of 13 weeks. It was also planned that at the end of the training sessions of each of the training courses a set of assignments was given to the participants for their self-training. These assignments were to be carried out from January to the end of March 1979. In addition, it was desired that the SCA's participants had a sufficient opportunity to closely observe how seaborne trade operations are conducted at the points of cargo loading and discharging in Japan.

5.3 Organization of the Training Program

In order to implement the objectives of the training program explained in the previous Chapter, the present training curriculum was organized and carried out in accordance with a 13 week schedule, from September 26 to December 26, 1978. In this Chapter a detailed explanation will be made as to what and how the training program was conducted in Japan.

As indicated below, the training program was divided into 5 separate training curriculum courses in addition to an orientation course and an extra-curricular activity of field trips in Japan.

No.	Curriculum Title	Institutes & Place	Week
	A General Outline of Training Program in Japan; Course Orientation of Training Curriculum	Mitsubishi Research Institute (MRI, Tokyo)	1st Week
No. 1	An Introduction to Maritime Transportation	Japan Maritime Research Institute (JMRI, Tokyo)	2nd & 3rd Week

No.	Curriculum Title	Institutes & Place	Week
No. 2	An Introduction to Basic Mathematics, Statistics and Computer Programming	Port and Harbour Research Institute (PHRI, Yokosuka)	4th, 5th and 10th Week
No. 3	Basic Methodologies for World Economy, Trade and Transit Analysis and Forecasting	Kyoto University Group (KUG, Osaka)	7th, 8th and 9th Week
No. 4	Exercises for Transit Forecast and Project Evaluation	Mitsubishi Research Institute (MRI, Tokyo)	11th & 12th Week
No. 5	Workshop of Job Initialization of the Economic Unit	Mitsubishi Research Institute (MRI, Tokyo)	13th Week
	Extra-curricular Activities	Field Trips: Sponsored by Japan International Cooperation Agency (JICA, Kyushu, etc.)	6th Week

Each of these training courses was organized according to developmental stages and sequential order so as to enable the SCA's participants to go through step by step learning processes and finally, at the end of the training period, they were to reach a point where they had been sufficiently exposed to all of the research problems and methods of the Economic Unit.

As indicated in Figure II.9, the entire training program was divided into three parts. They were preceded by a brief preparation and self-training program given at the SCA prior to coming to Japan and followed by the self-training program and assignments to be completed during January~March 1979. These will be briefly explained in the following paragraphs.

(1) Basic Training of the First Part

In this part the trainees were required to get themselves familiarized with basic problems, concepts, methods and techniques which are closely related to expected future work of the Economic Unit, and this objective would be attained through attending the following curriculum courses:

A General Outline of the Training Program in Japan; (Course Orientation of the Training Curriculum)
An Introduction to Maritime Transportation
An Introduction to Basic Mathematics, Statistics and Computer Programming
Basic Methodologies for World Economy, Trade, Transit Analysis and Forecasting

A total of 9 weeks was spent on the basic training course in the first part.

(2) Application Exercises and Problem-Solving in the Second Part

After having sufficiently acquired basic knowledge and skills necessary for understanding a variety of problems or issues that might confront the Economic Unit in the SCA, trainees were asked to move to the next stage of application exercises and the problem-solving course. They were given concrete problem examples of the Suez Canal, by means of which they will have opportunities to apply the knowledge and methods acquired in the first stage into actual

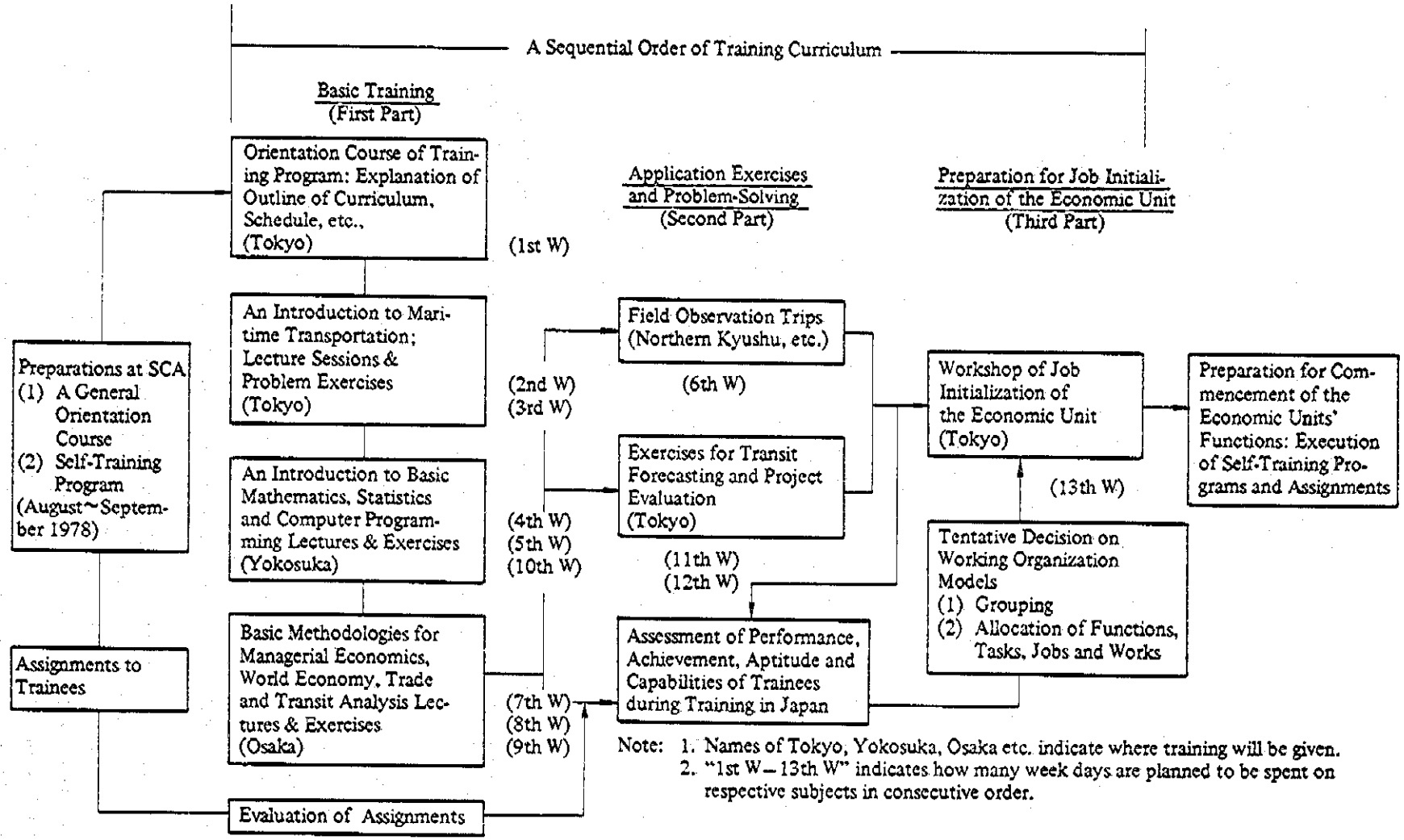


Fig. II.9 Outline of Training Program in Japan (October~December 1978)

problem-solving situations. This task was given in the following curriculums.

1) Exercises for Transit Forecasting and Project Evaluation
2) Extra-curricular Activities of Field Observation Trips

This part should be regarded as being of considerable importance for the trainees, for whether the concepts and methods previously studied by trainees would become actual tools of analysis of Suez Canal problems will depend entirely upon how much they have learnt from the problem exercises of this stage. It was strongly urged that trainees would pay special attention to the expected outcomes resulting from this stage of the training program. Field observation trips were also planned and were designed to serve the purpose of providing trainees with opportunities to observe actual seaborne trade operations in Japan so that they would be able to develop a "feeling" of how actual shipping problems are tackled at the points of loading and discharging cargos in harbors of Japan. A total of three weeks was planned to be spent upon this stage of the training.

(3) Preparation for Job Initialization of the Economic Unit; the Thire Part
All of the previous training programs should be converged to this final stage of the training program in Japan, and from this stage on the trainees were encouraged to become self-oriented and self-supporting so as to be able to play a part in the organizational team of the Economic Unit. They must develop a sense of purpose in their career development to become professional researchers for the Suez Canal Authority.

All necessary instructions were given to trainees during the workshop with regard to; 1) how to provide valuable information and research services to the decision making process of the Suez Canal Authority; 2) how to effectuate their planning and research activities and how to plan, manage, implement and control their activities; 3) how to hammer out organizational and behavioral problems that might arise relating to their research activities within the Department and SCA.

5.4 Allocation of Training Program Hours

Total days and lecture hours allocated to the training in Japan were 60 days (270 hours), Table II.7 shows how this time was allocated to each of the training curriculum units. However, the allocation of the training hours should be interpreted with the following notes in mind;

(1) The SCA's participants were expected to spend an average of three hours every training day on self study of the training curriculum subjects; their self study hours would amount to about 200 hours during three months training in Japan.

(2) In light of the general teaching curriculum policy at post-graduate school (70~80 hours for lectures and 100~150 hours for self studying per course unit), the training program designed for the SCA participants will correspond to three curriculum units at the graduate school level.

(3) In addition, a full three month period was made available to the SCA participants at the SCA for their review study and supplementary readings of the subjects that were taught in Japan.

Table II.7 Training Curriculum Organization

		Objectives of the Program	Training Program Contents	Days	Training Institutes
	An Orientation Course; A General Outline of the Training Program	A briefing of the objectives & training program contents	Training course explanation, program organization, training institutes and information on life in Japan	5 days;	Mitsubishi Research Institute (MRI)
No. 1	An Introduction to Maritime Transportation Problems	Explanation of maritime transportation problems relevant to the SCA	Lecture & discussion sessions on liner and tramp shipping markets, a variety of shipping problems	10 days;	Japan Maritime Research Institute (JMRI)
No. 2	An Introduction to Basic Mathematics, Statistics & Computer Programming	An introductory explanation on statistical data, analysis techniques and computer programming	Lecture & problem exercises on algebra and elementary calculus, descriptive statistics, elementary programming	15 days;	Port and Harbour Research Institute (PHRI)
No. 3	Basic Methodologies for World Economy, Trade & Transit Analysis and Forecasting	An introduction to theories, and methods of world economy & trade, economic analysis of management & transit	Lecture & problem exercise sessions of international trade, managerial economics	15 days	Kyoto University Group (KUG), Professors of Kyoto, Okayama & other universities
No. 4	Exercises for Transit Forecasting & Project Evaluation	Analysis exercises of the SCA problems	Lecture & application problem exercises of forecast and project evaluation	10 days	Mitsubishi Research Institute (MRI)
No. 5	Workshop of Job Initialization	A brief explanation of research planning, execution & control, and research organization management	Lecture & workshop sessions on the SCA's research needs and the Economic Unit's roles; assignments	5 days	Mitsubishi Research Institute (MRI)
	Extra-curricular Activities; Field Trips	Field observation trips of actual sea-borne trade operations in Japan	Visits to harbours of SHIMONO-SEKI, KITAKYUSHU, KOBE, KASHIMA, etc.		Japan International Cooperation Agency (JICA)

(4) The training curriculum hours were allocated according to the following priority order of the subject;

1) Seaborne trade analysis and project evaluation; a combination of curriculum numbers, No. 3 and No. 4
2) Data analysis technique of maritime statistical data; curriculum number No. 2
3) Introduction to maritime transport problems; curriculum number No. 1.

It was strongly urged that the SCA's participants will efficiently use their study hours in order to achieve the training objectives set forth for the first year training in Japan. The training program in Japan was designed to concentrate on selected subjects and methodologies which are closely related to the SCA's problems.

5.5 Curriculum Contents of Training Program

It was planned that the following subjects would be covered in the respective training courses and lecture notebooks or training texts were provided for the participants in advance. The subjects are briefly explained in the following paragraphs.

(1) Curriculum No. 1 An Introduction to Maritime Transportation

1) Maritime transportation business, structure of maritime transport, and basic problems of shipping

2) Tramp shipping (dry cargo movement, tramp fleet, dry cargo market and charter parties, etc.)

3) Tanker shipping (oil cargo movement, tanker fleet, ownership of oceangoing tankers, tanker market, tanker freight rate, etc.)

4) Liner shipping (general cargo movement, liner fleet, freight market, liner shipping market, liner shipping conference, etc.)

5) Transportation cost analysis (classification of costs, capital ship and voyage costs, etc.)

(2) Curriculum No. 2 An Introduction to Basic Mathematics, and Computer Programming

Mathematics

1) Review
2) Function and graph
3) Logarithms
4) Linear equations and linear functions
5) Solving equations
6) Quardratic function and equations
7) Permutation, combinations and binomial theorems
8) Polynomial
9) Inequalities
10) The derivative

11) Integration

Statistics

1) Variables and graphs
2) Frequency distribution
3) Mean, median, mode and other measures
4) Standard deviation and other measure of dispersion
5) Elementary probability theory
6) Binomial, normal and Poisson distributions
7) The methods of least squares and correlation theory

Introductory Computer Programming

1) Concept of Fortran
2) Constant and variables
3) Expression
4) Array and subscript
5) Specification statement
6) Control statement
7) Input and output statement
8) Statement functions
9) Fortran sub-programs
10) Sub-routines and argument

(3) Curriculum No. 3 Basic Methodologies for World Economy, Trade and Transit Analysis and Forecasting

1) Managerial economics (Concepts of risk and uncertainty, profit theories, demand analysis, cost analysis, pricing, etc.)

2) Systems analysis of world economy, seaborne trade and Canal transit volume

3) General trends of world economy and seaborne trade

4) Origin and destination matrix and other methods of seaborne trade analysis and forecast

5) Statistical methods of Canal transit volume analysis

6) Methods to be used for estimation of the Canal traffic

7) Convoy system

8) Systems analysis methods

(4) Curriculum No. 4 Exercises for Transit Forecast and Project Evaluation

1) Introduction to feasibility study
2) Forecast of seaborne trade flows
3) Transit forecast methods
4) Evaluation of the Canal capacity

5) Methods of project evaluation

(5) Curriculum No. 5 Workshop of Job Initialization of the Economic Unit

1) Planning and decision making of the SCA management and research and information needs
2) Types and fields of management research
3) Research planning, implementation and control
4) Research report writing
5) Research organization management

5.6 Evaluation of Participants' Performance and Aptitude

It must be noted that during the period of training in Japan trainees were evaluated with respect to their general capabilities and aptitude, as to whether they are suited to the job of a professional researcher. The purpose and method of assessment of their abilities are briefly explained below:

(1) Purpose of Evaluation

1) To find out what kind of functions, tasks and jobs the trainees are most suited to.

2) To assess their general capabilities and aptitude in order to plan a training program in the following years that will be adequate for them.

3) To judge a level of workload for the Economic Unit which they are capable of performing as a minimal standard of productivity.

(2) Method of Evaluation

1) To evaluate the results of assignments given to trainees at the SCA by JST.

2) To administer a series of written tests during the training period in Japan concerning each of the curriculum subjects.

3) To make a tentative judgment as to the overall capabilities and aptitude of trainees by the end of 13 weeks by taking into consideration all of the results of the examinations.

(3) What was evaluated

1) General capabilities and aptitude as to whether they meet the qualifications of a researcher and planner.

2) Ability to think in terms of a logical frame of reference.

3) Ability to analyze problems and synthesize findings of research.

4) Motivation, initiative, leadership, and other personality traits.

5) Ability to express ideas and to organize one's own thought.

6) Technical skills, speed and exactness in carrying out tasks.

5.7 Assignments and Instructions for the Self-Training Program

During the last week of the training in Japan, assignments and instructions were given to the SCA participants concerning their self-training program that they will carry out by themselves at the SCA. As previously indicated, there will be a period of several months available to them for their self-training, between the end of the technical training in Japan (T.T.J.) and on-the-job training at the SCA (O.J.T.). The self-training program was designed to serve a double purpose as mentioned below;

(1) Review and supplementary study of what they have already learned in the previous step of the training

(2) Necessary preparations that must be made for the succeeding step of training

For the former purpose, a set of problem exercises was assigned to individual participants and must be completed during the period of January~March 1979. The problems were selected from five training curriculum subjects. For the latter purpose, a series of actions will be carried out by the Japanese consultants who will be despatched to the SCA in February 1979; 1) explanation of a final draft report on organization of the Economic Unit, 2) procurement plan of necessary research materials and supplies, 3) instructions as to how the Economic Unit's jobs must be initialized, and 4) training program for the new recruits who will be selected by the SCA.

In the first year, the assignments were given in the following problem areas;

(1) Maritime transport and Canal transit problems
(2) Mathematics
(3) Managerial economics
(4) Analysis and forecast methods of world trade and Canal transit volume
(5) Project evaluation

5.8 Training Organizations, Staff Members and Other Related Problems

As frequently mentioned in the previous Chapter, a large number of government and non-government organizations and staff members participated in the training program in Japan. In order to avoid possible confusion that might arise as to their respective roles, a brief description will be made here on their functions.

(1) Japan International Cooperation Agency

This training program in Japan is organized by the Japan International Cooperation Agency (JICA), a public corporation for technical cooperation services for the Government of Japan. It was requested that the SCA participants feel free to consult with officers in charge of JICA

whenever questions might arise concerning accommodations, allowances, hospital and health care and other problems relating to the training life in Japan.

(2) Training Institutes

Actual training programs were carried out by professors and research staff members of government and non-government organizations. It was asked that questions relating to the contents and methods of the training programs be addressed to the persons in charge of the respective training curriculum. The organizations which participated in the present training program are as follows;

1) Government Organizations
   (a) Kyoto University Group (Professors of Kyoto, Kagawa and Okayama Universities)
   (b) Port and Harbor Research Institute (PHRI), Ministry of Transport

2) Non-Government Organizations
   (a) Mitsubishi Research Institute (MRI)
   (b) Japan Maritime Research Institute (JMRI)

The training program was conducted at various Institutes in different cities in Japan, and it was often necessary for the SCA participants to move from one place to another. It was advised that the SCA participants carefully follow the instructions given to them by the training staff members in charge. Names of the organizations and staff members in charge are given in Appendix VI.

As a reference, a schedule of the training program in Japan will be attached in Appendix VII. In principle, the training sessions were scheduled to be held five days a week, four and a half hours a day.

Practical information on the training program and life in Japan was provided to the SCA participants in advance, and it was urged that instructions given to them should be carefully observed. The instructions calling for special attention are listed in Appendix VIII.

CHAPTER 6 ON-THE-JOB TRAINING AT THE SCA

Enough has been said about the objectives and ways and means by which on-the-job training will be conducted at the SCA. In this chapter, only a brief explanation will be made on the nature of this aspect of the cooperation program, since its technical details will be determined only after close consultation has been made with the SCA's management in the early part of 1979. It must, therefore, be noted that what is explained here is only provisional and must be officially approved by the respective authorites concerned.

6.1 Self-Training Program

During the interval period between the end of the training program in Japan and the beginning of on-the-job training at the SCA, staff members of the Economic Unit will have a three-to-four month period of self-training program. As frequently mentioned, this will be designed to serve the following purposes;

(1) To review the lessons learnt in the previous months in Japan; this process is designed to go over again what the trainees learnt in Japan and will be of considerable importance, for the training sessions in Japan are likely to be intensive and go very quickly in order to cover a wide range of subjects and methods in a short period of time. Because of this, trainees must have a breathing period of certain length to digest what they have acquired.

(2) To apply the knowledge and methods that they have studied on concrete application problems; it must be said that the best method of learning is "learning by doing", and this pedagogical dictum should be applied here too. It is considered that writing a short analysis report on certain selected topics will be quite effective for this purpose. The subject matter will be selected from those upon which the learned concepts and methods are to be directly applied.

(3) To encourage trainees to develop a sense of self-supporting and independent research work; self-reliance is one of the most important attributes of the professional researcher and analyst, and the ability of thinking and judging problems by themselves, initiatives and attitude of probing could be cultivated through the self-training program.

For these reasons great importance will be attached to this self-training program. In order to attain the objectives of this program, attention should be drawn to the following points:

(1) The program must be geared to the individuals' interest and capabilities.

(2) Necessary materials and textbooks should be made available to them.

(3) Topics and subjects must be best suited to the level of knowledge and abilities they have already attained.

6.2 On-The-Job Training Program at the SCA

As frequently indicated before, it is planned that the Japanese consultants and experts will be dispatched to the SCA for the necessary period of time to render professional consulting services to the Economic Unit's staff members. The purpose of this program is several-fold as listed in the following;

For the Core Group

(1) To offer professional guidance and assistance to the trainees concerning their tasks of research output production.

(2) To continue their professional training in specialized fields of Economic Research, System Analysis, and management problems of the Economic Unit.

(3) To deliver a series of lectures on selected topics and subject matters which are considered relevant to their job requirements.

For the New Recruits

(1) To offer an accelerated training course on the training programs that the core group has already taken.

(2) To devise necessary measures to arrange their working relationships with the core group.

What kind of on-the-job training program will be needed for the individual members of the Economic Unit will be determined by taking into careful consideration the following factors at each end of the training program in Japan;

(1) The information requirements o the SCA
(2) Availability of the research materials and other supporting facilities and tools at the SCA
(3) Research capabilities and productivity of the Economic Unit's staff members

6.3 Research Assignments

At the end of on-the-job training at the SCA a set of research assignments will be given to trainees on the basis of a judgment of individual needs and capabilities. The purposes of this program are as follows;

(1) To provide the trainees with sufficient preparation for their forthcoming training in Japan, both for a core group and new recruits. For this purpose necessary study materials will be provided to them.

(2) To provide trainees incentives to produce research output by themselves while the Japanese consultants are away from the SCA; for this purpose a set of assignments will be given to them.

CHAPTER 7 PROBLEMS TO BE CONSIDERED FOR THE NEXT STAGES OF THE TRAINING PROGRAM

7.1 Introduction

A sufficient amount of evidence has become available to us to evaluate the capabilities of the SCA participants, as the first year training program was already completed. This Chapter presents a set of recommendations and suggestions as to what and how the training programs should be planned and implemented on the basis of the progress made by the participants in the first year. However, the recommendations or suggestions should be interpreted by taking into account the following;

(1) They are concerned mainly with the training programs that are planned to be carried out in the next stage.

(2) As for the training program of the third stage, different recommendations may be made at the end of the training program of the second stage.

(3) Special considerations must be given to the nature and types of training needs of new recruits of the Economic Unit.

(4) Emphasis may be placed upon a variety of the technical aspects of the methods of project evaluation during the later stages of the training program, as the feasibility study of projects may become one of the major tasks of the Economic Unit in the future.

(5) The detailed contents of the training program of the second stage (the Japanese fiscal year; 1979/4 ~ 1980/3) will be spelled out, as frequently mentioned before, in the Scope of Work which is expected to be concluded between the SCA and JICA in March 1979.

(6) It is urged that the SCA management would freely discuss the matters concerning the general framework and contents of the technical cooperation program that were suggested in this report, with the member of the Contact Mission of the JICA.

7.2 Problems to be Considered for the Next Stage of the Training Program

On the basis of the evaluation results of the first year training in Japan, a basic guideline can be drawn to design the training curriculum program for the following years. It is our view that the following should be taken into consideration when the training program is planned for the next stages.

The training program should be separated and specialized into the three major functional areas of the Economic Unit; the first is a training program for the Economic Research Group; the second is a program for the Systems Analysis Group and the third is a training curriculum for research planning, execution and management functions.

A variety of manuals should be prepred for the trainees in which detailed instructions are to be

given indicating the steps of work and research procedures to be followed to undertake specific research programs or projects. Technical know-how should also be taught through on-the-job training at the SCA, such as how a given research problem can be analyzed according to the instructions given in the research manuals.

It is suggested that short analysis techniques or methods should be taught to staff members of the Economic Research Group and forecast techniques and methods should be taught to the members of the Systems Analysis Group. However, in order to raise their level of understanding of the SCA planning and decision-making problems, the same problem areas should be covered for the training of both groups. The respective training curriculum plans are briefly described in the following sections.

7.3 Training Curriculum Plan for the Economic Research Group

It is recommended that the following training curriculum should be given to the staff members of the Economic Research Group in the following years.

Short Analysis Techniques and Methods
of the SCA's Internal and External Problems

(1) Objectives
To give the staff members good knowledge and methods of how to write short analysis reports on major and selected topics which are believed to be of considerable importance.

(2) Nature of training
The staff members must become able to describe and analyze in a summary form, external and internal problems which will affect the SCA Canal operations. They must acquire skills in describing current trends and developments, collecting and processing the information and data relating to the problems, and writing short "trend reports," "position reports," "review reports," and other non-technical reports that will be submitted to the SCA management. The purpose of these reports is to keep the SCA management informed of current situations of the SCA.

(3) Contents of Training; a) Problem Exercises
Different aspects should be covered. They are as follows;

1) World Economy and Seaborne Trade
- Collection of the statistical data of world economy and seaborne trade which will potentially affect the Canal traffic

- Techniques by which the statistical data can be summarized in graphs, tables, charts and other forms of visual presentation, so that the trends or current situations can be easily understandable to non-technical readers within the SCA

- Methods of statistical description of commodity flows of major products; e.g., GDP elasticity demand of oil and non-oil products of European countries, Frator methods, distribution models, origin and destination matrix, and statistical tools of seaborne trade analysis, etc.

– Simple methods of forecasting world economy and seaborne trade such as projections by growth rates, exponential smoothing, linear regression, etc.

2) Maritime Transportation Economics and Problems
– Understanding of the long-term development of the World fleet characteristics (number, size, and type of vessels)

– A good knowledge of shipping market mechanisms of tramp, tanker and liner shipping

– Skills in analyzing statistical data of freight rates such as World Scale, etc.

– Transit fleet mix of oil transporting fleet and non-oil traffic fleet

3) Shipping Costs
– A good understanding of shipping costs classified into capital costs, fixed operating costs, and voyage costs

– Technical knowledge of the shipping costs structure of oil tankers and dry cargo vessels

– Calculation skills of unit transport costs and route costs

– A good understanding of the relations between shipping costs and freight rates

4) Descriptive Analysis of Canal Transit Volume
– Descriptive analysis of transit data by ship type, size and loading conditions, and by commodity

– Trend projections of transit patterns

– The effects of tariffs upon transit volume

5) Study of Tariff and Canal Revenue
– Methods of determining tariff levels

– Pricing policies and principles; cost plus approach and market demand approach

– Strategies for setting proper level of tariff

– Methods of revenue calculation

– Effects of tariff upon route and shipping costs

6) World Energy and Oil Trade
– Descriptive analysis of demand and supply of world energy

– Review analysis of various studies made upon the world energy problems and projections

– Projections of oil and products in the future

(4) Contents of Training; b) Methodology and Theoretical Framework of Analysis
The training courses designed to teach theories, concepts and analytical methods relevant to the problem exercises should be given to the SCA participants either at lecture sessions or as the subjects for self study and supplementary reading. They are as follows;

1) International economics and trade
2) Maritime transportation economics
3) Managerial economics
4) Managerial accounting
5) Business statistics or introductory econometrics

7.4 Training Curriculum Plan for the Systems Analysis Group

For the staff members of the Systems Analysis Group the following training should be given in the following years.

Systems Analysis and Long-Term Forecast Techniques

(1) Objectives
To give to the staff members good technical knowledge and methods of systems analysis and short and long-term forecasts of the factors affecting the SCA operations.

(2) Nature of training
The staff members must become able to formulate mathematical models, to analyze alternative policy solutions, to forecast important events internal and external to the SCA by means of statistical tools, to develop computer program packages and softwares, to study project evaluation methods and other technical methods which require mathematical and statistical skills and knowledge.

(3) Contents of Training; a) Problem-Exercises
The different aspects of the SCA problems which require higher level of analytical techniques should be covered. They are as follows;

1) World Fleet of Tankers
   - Analysis of oil demand and supply projections
   - Analysis of oil demand and supply projections
   - Tanker fleet market trend analysis
   - Tanker fleet mix model analysis; existing world tanker fleet classified into various sizes of vessels, projected deliveries of new tonnage, annual scrappage and loss, laid up tonnage, slow steaming and other relevant factors to be considered.

2) Model Analysis of Tanker Shipping Costs
   - Cost calculation models for Tankers of various categories
   - Calculation models of route costs for Tankers of different categories

3) Canal Capacity Analysis
- Skills in formulating analytical models of the Canal capacity
- Collection and the analysis of actual data of the Canal capacity and operating variables
- Technical knowledge of the Canal operations of transit categories, limiting dimensions of vessels, Canal cross section, convoy system, and other Canal capacity constraint factors
- Probability distribution of arriving patterns of ships
- Congestion, waiting time, transiting speed, and accident analysis
- Effects of Canal expansion projects upon transit volume

4) Transit Volume Analysis and Forecast
- Formulation of systems analysis model of Canal transit volume; selection of input and output variables, exogenous and endogenous variables, systems flows of the variables, parameter estimation methods of equations, iteration and other calculation methods
- Analysis of transit volume by route choice models
- Effects of level of tariff upon Canal traffic

5) Tariff and Canal Revenue Analysis
- Determination of tariff by marginal revenue and cost analysis
- Optimization and sensitivity analysis of changes in level of tariff

6) Methods of Project Evaluation
- Methods of a project evaluation
- Theory and practical methods of Cost/Benefit analysis
- Financial and economic analysis of a project
- Assessment criteria of a project; cost/benefit ratio, internal rate of return, net present value, etc.
- Concept of shadow price and its use in economic evaluation
- Methods of calculation of costs and benefits

(4) Contents of Training; b) Methodology and Theoretical Framework of Analysis

The training courses designed to teach theories, concepts and analytical methods relevant to the problem exercises, should be given to the SCA participants either during lecture sessions or as the subjects to be learned through self-study and supplementary reading. The relevant disciplines are indicated as follows:

1) Mathematics and statistics
2) Systems analysis, management science and operations research
3) Computer programming and simulation techniques
4) Forecasting methods
5) Cost/benefit analysis

7.5 Training Curriculum Plan for Research Management

It is advised that business research methods and management theory and practices of research organization should be continuously taught to the staff members of the Economic Unit. The former subject should be taught to all members of the Economic Unit and the latter to senior members of the Economic Unit.

(1) Objectives
To give to the staff members a good practical knowledge and methods of how to plan, execute and control a research program and/or project.

(2) Nature of Training
The staff members of the Economic Unit must be able to initiate a research program or project by themselves and carry it out through every necessary step, to a point where a research report can be written and submitted to the SCA management as is required. The best method of learning the skills necessary for research planning, implementation and management is the practical experience of actual research work. On-the-job training will thus be considered as an effective means to achieve the objectives.

(3) Contents of Training
The following fields should be taught to the staff members;

1) Business Research Methods
2) Management theory and practice of research organization
3) Introductory management science and accounting.

APPENDICES

APPENDIX I

ORGANIZATION FOR THE IMPLEMENTATION OF TECHNICAL COOPERATION PROGRAM

1. STEERING COMMITTEE

For the successful implementation of the technical cooperation program to the Planning and Research Department of the Suez Canal Authority (SCA), a Steering Committee was established by Japan International Cooperation Agency (JICA) as an advisery body to the Chairman of JICA. The members of the Committee are as follows.

Table AI.1 Members of Steering Committee

Dr. Yoshimi NAGAO Chairman	Professor, Faculty of Engineering, Kyoto University
Mr. Mitsumasa IWATA	Director, International Affairs Division Minister's Secretariat, Ministry of Transport
Mr. Sumio SHIOTA	Director, Overseas Division, Bureau of Shipping, Ministry of Transport
Mr. Shun-ichi ONODERA	Director, Construction Division, Ports and Harbours Bureau, Ministry of Transport
Mr. Fumiaki NAGATOMO	Head, Shimonoseki Investigation and Design Office, The Fourth District Port Construction Bureau, Ministry of Transport
Mr. Yasuhide OKUYAMA	Chief, Systems Laboratory, Design Standard Division, Port and Harbour Research Institute, Ministry of Transport
Mr. Hisashi MISHIMA	Deputy-Director, Overseas Division, Bureau of Shipping, Ministry of Transport
Mr. Satoshi INOUE	Deputy-Director, Planning Division,Ports and Harbours Bureau, Ministry of Transport

The Committee has provided appropriate advices to the Survey Team for the technical cooperation program, composed of the members of Mitsubishi Research Institute and Japan Maritime Research Institute, by inspecting and guiding the plans and products prepared by the Survey Team.
The organization for the implementation of the program is shown below.

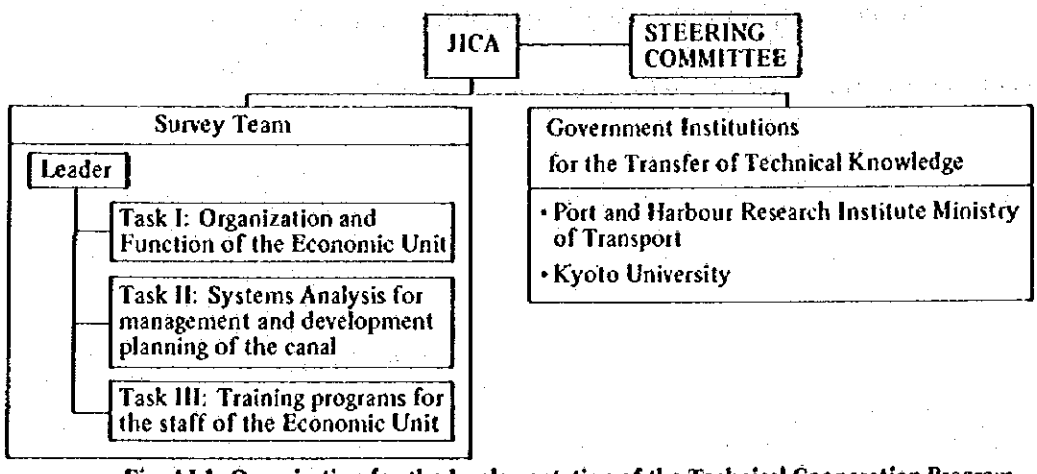


Fig. AI.1 Organization for the Implementation of the Technical Cooperation Program

2. DISPATCH OF FIELD SURVEY TEAMS

In order to meet the specific requirements of the technical cooperation program, field survey teams were dispatched to the SCA for the studies on the organization and function of the Economic Unit, on the systems analysis techniques for the management and development planning of the Canal, and on the training programs for the staff of the Economic Unit.

A. Field Survey Team

Period: July 14 ~ August 11, 1978 (28 days)

Purposes:
1) Explanation and discussion of the Inception Report of the program prepared by the Survey Team
2) Information gathering from various departments of the SCA
3) Information gathering from the selected agencies and institutions related to the SCA
4) Orientation of training programs in Japan for the trainee candidates in the Unit

B. Survey Team for the Interim Report

Period: November 18 ~ 28, 1978 (11 days)

Purposes: Explanation and discussion of the Interim Report on the organization and function of the Economic Unit

C. Survey Team for the Draft Final Report

Period: February 11 ~ 23, 1979 (13 days)

Purposes:
1) Explanation and discussion of the Draft Final Report on the organization and function of the Economic Unit
2) Explanation of the results of 1978 training programs in Japan
3) Tests of newly recruited candidates for the staff of the Unit
4) Follow-ups of the systems analysis study
5) Preparation for the initialization of the Unit's operation

The members of the field survey teams are listed in Table AI.2.

Table AI.2 Members of Field Survey Teams

Name	Organization	Responsibility
Fumiaki NAGATOMO	(MOT)	Member of Supervisory Committee
Yasuhide OKUYAMA	(MOT)	Member of Supervisory Committee
Satoshi INOUE	(MOT)	Member of Supervisory Committee
Yoshio SATO	(MRI)	Leader of the Survey Team
Morimitsu INABA	(MRI)	Assistant to the Leader
Yoshio OSADA	(MRI)	Task I
Tsutomu NISHIMURA	(MRI)	Task I
Toshiki KURASHINA	(MRI)	Task I
Noboru SUGINO	(MRI)	Task III
Yoichi AOKI	(MRI)	Task II
Hisayoshi MORISUGI	(MRI)	Task II
Katsumi AKIBA	(JMRI)	Task II
Saburo TAKAMURA	(JMRI)	Task III

MOT: Ministry of Transportation
MRI: Mitsubishi Researchi Institute
JMRI: Japan Maritime Research Institute

APPENDIX II*

A CASE STUDY OF RESEARCH AND PLANNING FUNCTIONS (1)
– Teito Rapid Transit Authority (TRTA) –

1. OUTLINE

1.1 Objectives

To engage in construction and operation of rapid transit subways for the purpose of improvement and expansion of the transport facilities within the Wards and the adjacent areas of Tokyo.

1.2 Establishment

TRTA was established in 1941 under the Teito Rapid Transit Authority Law, taking over the operating railways and licensed lines owned by the two private subway companies.

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* The organizational structure and function of research and planning units of typical Japanese non-private corporations are shown in the APPENDICES II & III as illustrating and referring to "the research and planning functions."
Selection of organizations was carefully conducted in order to allow us to convey to the reader of this report the clearest possible understanding of the concepts of research and planning functions according to the following criteria:

(1) Public corporation or semi-public corporation, which is to pursue profits under polistic business conditions.
(2) Size of the Organization should be somewhere around 10 thousand personnel.
(3) Long history and stable management situation.
(4) Relatively high degree of independence for planning and management decision making. (Japanese public corporations are more or less under the regulation and control of a supervisory ministry).
(5) To have experienced new project plans and rate revisions.
(6) To engage in business relating to transportation, traffic or ports, (if possible).

In satisfaction of these criteria, the two cases were selected.

1.3 Capital and Investors

The Authority's capital as of March 31, 1978 was 40.1 billion yen, invested 55% by Japan National Railways and 45% by the Tokyo Metropolitan Government.

1.4 Scale of Operation

	1977	1967	1977/1967
Operational Track (kilometers)	124.9	77.8	(1.6)
Passengers per Day (thousand)	4,200	2,213	(1.9)
Ticket Sales per Day (¥million)	252	53	(4.8)
($ thousand)	(1,260)		
Rolling Stock (No. of Cars)	1,566	983	(1.6)
No. of Employees	10,381	7,989	(1.3)
Capital (¥million)	40,100	20,100	(2.0)
($million)	(200.5)		

Note: The conversion rate used in this report is ¥200 to U.S. $1.00 unless otherwise indicated.

1.5 Organization and Management

Supervisory Commission:

The Authority's revenue and expenditure budget, new operating and fund plans and settlement of accounts are subject to approval by the Supervisory Commission.

Managing Directors:

The board of directors consists of the President, one Vice President, eleven Managing Directors and three Auditors, all to be appointed by the Minister of Transport.

Employees:

Approximately 10,400, including 1,000 in the head office and 9,400 in work site operation.

Organization:

See Organization Chart attached. (Figure AI.1)

Transit Bonds:

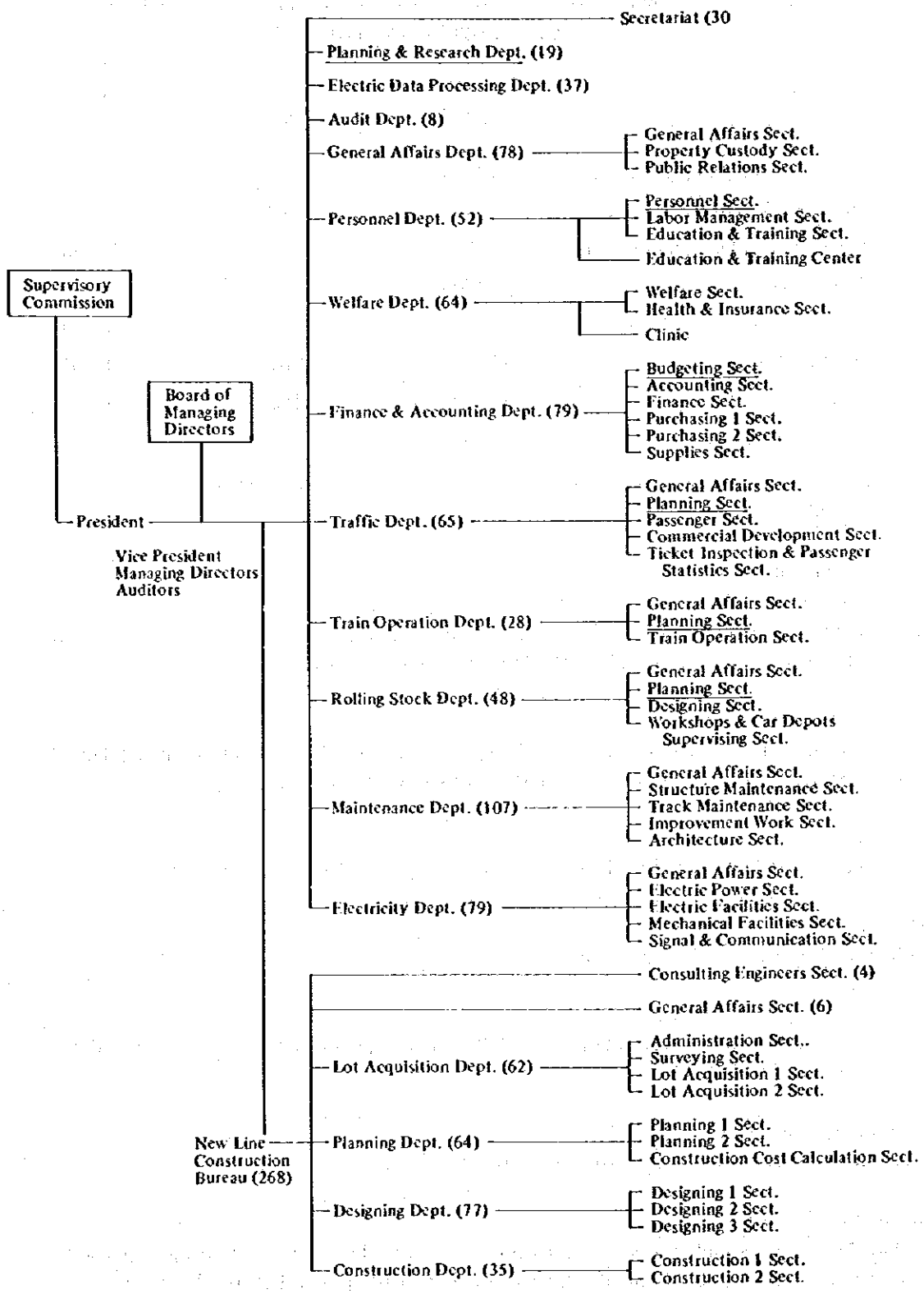
The Authority may issue Government-secured Transit Bonds totalling up to ten times the amount of its paid-in capital.

Government Loans:

The Authority is entitled to loans from Government funds.

Government Aid and Supervision:

(1) The Authority is under supervision of the Minister of Transport. New project plans, rate revisions, budgets, etc. of the Authority are subject to approval by the Ministers concerned.



Note: Numbers in parentheses indicate the number of staff belonging to the group.

Fig. AI.1 Organization Chart (Departments in the Head Office)

(2) The Minister of Transport has the authority to instruct TRTA to construct or improve the rapid transit subways.

(3) The Government is authorized in accordance with the provisions of the pertinent ordinance to grant subsidies to the Authority within its budgetary framework. Currently a subsidy for construction of new rapid transit subways is granted to the Authority.

2. RESEARCH AND PLANNING FUNCTION AND ORGANIZATION

2.1 Outline

2.1.1 Decentralized Function

The Authority's research and planning function is not centralized. Each of the operational departments conducts some planning and research functions independently, to cope with their specific problem solving within the specific departmental operation.

In cases of strategy planning or the Authority's top projects such as construction of a new line (a case study follows), all head office departments concerned participate in formulating plans. Each department takes charge of a portion of the project in accordance with their function and speciality.

All partial plans are discussed at a central meeting called to achieve coordination of all of the participating departments and to put together a complete project plan. If this meeting is unable to reach a conclusion, further discussions and adjustments will be made at a managers or directors meeting.

2.1.2 Relationship with the Supervising Ministry

In the case of new line projects, the strategic plans such as routing and network set-ups are made in the offices of the Ministry of Transport. The Authority's planning staff assist the Ministry officials, at their request, offering fact data on the existing lines, etc. Once the plan for urban rapid transit railway networks is issued as formal notifications by the Minister of Transport and the Governor of the Tokyo Metropolitan Government, the Authority is able to initiate a new line construction project. At this stage the Authority makes a choice on which line it should request a business permit for, according to the network plan.

2.2 Organization and Function

The organization, staffing structure and responsibilities of the Authority's research and planning departments are described below.

2.2.1 Planning & Research Department

This department prepares and adjusts basic plans for the Authority's top projects collecting basic data required for project planning. It consists of the Manager, 3 section chiefs, 1 investigator, 6 group leaders and 8 other staff, totalling 19 members including one engineer. Intersectional distribution of staff changes as required. At present, the department is divided into the following three sections:

Section No. 1 – 7 members
– Preparation and adjustment of the investment budget plans for reconstruction of the existing subways and construction of planned lines.

Section No. 2 – 8 members
– Data processing of the periodic reports submitted by each department.
– Collection of information on operations and technology and data on subway lines in other cities.
– Planning and research on affiliated businesses
– General affairs of the department

Section No. 3 – 3 members
– Management planning such as the long-term financial forecasts, base data collection for rate revision plans, construction permit applications, etc.

The department is also responsible for work relating to:

(1) the urban rapid transit railway network plans
(2) traffic control plans
(3) the Authority's basic management plans
(4) basic plans for new projects
(5) preparation and coordination of various business plans
(6) budgeting, budget control and found procurement plans for new construction and improvements
(7) basic plans for the Authority's total budget
(8) research required for management of the Authority, including statistical research
(9) other special projects

2.2.2 Planning Department, New Line Construction Bureau
This department, started in the reorganization which went into effect in February 1973, is separated from the Bureau's Designing Dept. and is in charge of the basic research and plans for new line construction projects. It consists of 64 personnel, mostly engineers, in 3 sections as explained below:

Planning Section 1 – 15 members divided into 2 groups
(1) Technological research and studies relating to the urban rapid transit railway networks
(2) Basic research and studies on the construction of planned new lines
(3) Budget control for the construction of new lines
(4) Filing of related documents, charts and data
(5) Any other work relating to new line construction projects

Planning Section 2 – 15 members divided into 2 groups according to the construction area
(1) Research and planning for applications for new line construction permits
(2) Procedures relating to the city planning
(3) Coordination with other business located in the construction areas
(4) Any work relating to the basic plans for new line construction
(5) Filing of related documents and charts

Construction Cost Calculation Section – 34 members,

(1) Estimation of contract amounts for construction
(2) Estimation of other contracts required for design changes and additional, appurtenant and consigned work
(3) Filing of related documents and data

2.2.3 Planning Section, Traffic Dept.

Consists of 7 members, no engineers, including the section chief, 1 investigator, 2 group leaders and 3 staff and handles passenger estimation, tariff control, rate increases, station plans and remodeling plans. Their specific responsibilities are to work out:

(1) Tariff control
(2) Determination, revision and cancellation of rates
(3) Determination of passenger volumes
(4) Basic research and planning on the transport facilities
(5) Planning for traffic connection with other modes of transportation
(6) Application for validation to supervising government organizations
(7) Planning on any other projects relating to passenger operations

2.2.4 Planning Section, Train Operation Dept.

This section has a section chief, 3 group leaders and 6 staff, 10 members in total, all engineers. The section is in chasrge of:

(1) Train operation plans
(2) Planning for operation equipment and facilities
(3) Planning for the arrangement of train workers
(4) Basic research and planning on operation safety
(5) Investigation and analysis of accidents caused by broken safety devices
(6) Planning for extended operation with other railway companies and its operation safety system
(7) Filling of related documents and charts
(8) Any other plans relating to train operation and safety

2.2.5 Planning Section, Rolling Stock Dept.

Includes 11 members, all engineers, a section chief, 2 group leaders and 8 staff. Their responsibilities are to prepare:

(1) Basic research and planning for the rolling stock, workshops and maintenance facilities
(2) Pollution control plans such as noise, dust and wastes from the rolling stock, workshops and maintenance facilities
(3) Research and planning for the workshop and car depot supervising systems
(4) Estimates of contract amounts for construction of cars and maintenance facilities
(5) Purchasing plans for the construction materials used in number (4) above
(6) Filing of related documents and charts
(7) Other related projects

2.2.6 Labor Management Section, Personnel Dept.

Handles employee assignments and budgeting of wages and salaries. Consists of 14 members, no

engineers, a section chief, 2 group leaders and 11 staffs.

(1) Research and planning for wages and salaries
(2) Employee assignment
(3) Budgeting of wages and salaries

2.2.7 Finance Section, Finance & Accounting Dept.
Handles fund procurement plans and procedures for capital increases, transit bonds, etc. Consists of the section chief, 2 group leaders and 8 staff, totalling 11 personnel.

(1) Funding plans
(2) Fund procurement plans
(3) Payment plans
(4) Capital increase, transit bonds and other loans

2.2.8 Budgeting Section, Finance & Accounting Dept.
Controls the Authority's overall budget and handles budgeting for revenues, and operating expenditures. Consists of 13 members, no engineers, consisting of the section chief, 3 group leaders and 9 staff.

(1) Total budget control
(2) Budgeting of revenues and operating expenditures
(3) Others

3. CASE STUDY

The two cases given below, New Line Project and Rate Revision, explain more specifically the in-house process of the Authority's project planning in relation to the Authority's other departments and the supervising Government offices.

3.1 New Line Project (see Figure AII.2)

In the past the Authority's subway construction has taken place every three to four years. Generally, planning was processed through the following three stages:

(1) To establish the Rapid Transit Railway Network
(2) To obtain Government permits
(3) To develop the construction and operation plans

3.1.1 Establishing the Rapid Transit Railway Network (Strategy Planning Stage)
The new subway network plan – in what area and from which town to which town – is mainly handled by the Project Planning Section and the Zone Planning Section of the Minister's Secretariat, Ministry of Transport. At this stage, the Authority, as project executor, only provides data and information to MOT officials as requested. The detailed procedures are as follows:

(1) Hearing
The MOT officials in charge of the project planning hold a hearing with participation:

1) By the prefectural governments involved, on their zone development and housing plans as

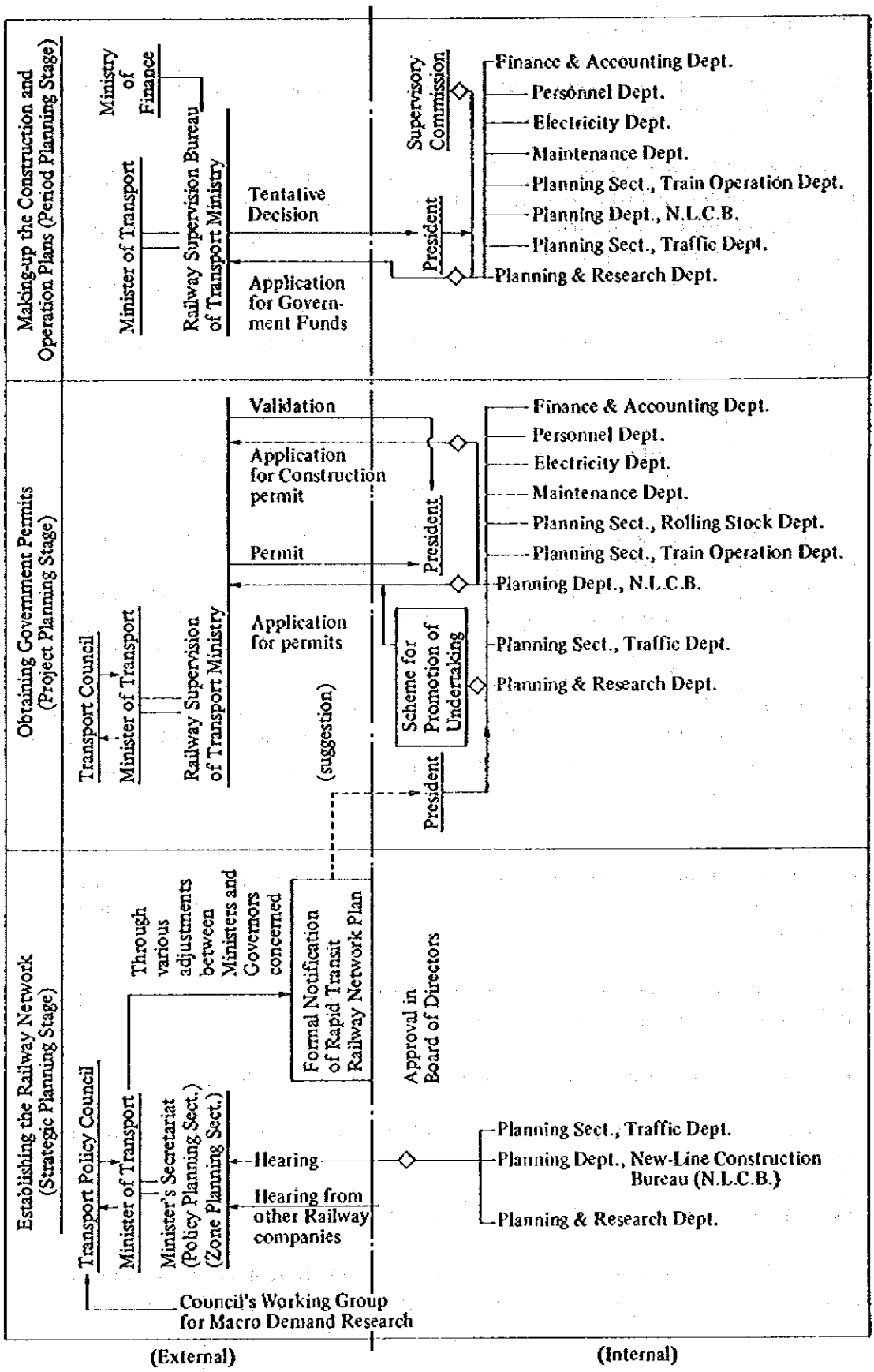


Fig. AII.2 New Line Construction Plan

the base data for passenger forecast

2) By the railway companies concerned, on their present conditions, future plans, construction capacity and operation capacity.

At the Authority, the Planning Dept. of the New Line Construction Bureau coordinates with the following departments and collects various data to be presented at the hearing:
- Construction plans for the permitted lines and data on the remaining construction capacity from the New Line Construction Bureau
- Various financial data and long-range revenue and expenditure budget from the Planning & Research Dept.
- Passenger statistics and crowd forecast of the operating lines from the Planning Section, Traffic Dept.

(2) Passenger forecast
MOT asks for a macro forecast of passengers, if necessary, from a private institution.

(3) Deliberation
The Minister of Transport requests advice on the basic plan for expansion of the rapid transit railway network from the Traffic Policy Council.
Note: The Traffic Policy Council consists of less than 50 scholars and experts, appointed by the Minister of Transport to serve as a member for 2 years.

(4) Specific Plans for the Network
The Council organizes the working group with the council members, who examine the rough draft of the network plan presented by the Minister's Secretariat, holding a hearing and making their own forecast on passengers, if necessary. Based upon their findings, the group completes a detailed plan for the network.

(5) Reporting
The Council submits the detailed network plan as the deliberation report to the Minister of Transport. The report submitted in 1972 prescribed the following guidelines for the railway networks of 1985:

1) To secure transportation capacity for more than 3,300,000 commuting passengers to the central Tokyo area from the peripheral towns.

2) To keep the maximum congestion ratio as low as 150% (250% in 1972).

3) To extend the railway network to the areas with less available transportation such as the newly developed bed-towns.

4) To expand the subway network by 500 km, with 13 new lines.

Upon receipt of the report, the Minister issues the plan for the railway network as a formal notification and the prefectural governments involved materialize the issued plan in their own urban plans.

3.1.2 Obtaining Government Permits (Project Planning Stage)

Who executes the Government's railway network project, undertaking the construction and operation of the planned new line? Besides TRTA, The Tokyo Metropolitan Government and the suburban private railway companies have become eligible for such undertakings. The choice of one party is made after negotiation among these eligible parties. The party chosen applies to the Ministry of Transport for the construction and operation permits presenting a scheme for promotion of the undertaking.

At the TRTA, the Planning & Research Dept. coordinates with the departments in charge to compile the scheme. The key points are how much money and how much time will the whole construction project require. Even though reasonable profitability is a must, the Authority, as a public corporation, sometimes has to accept the undertaking at a small profit. If this happens, the Authority may ask for Government subsidies and other aids.

Their procedures for the project planning are as follows:

(1) Location selection – Planning Dept., New Line Construction Bureau
Based upon the results of geological and technical surveys, the railway location is chosen and shown on the map.

(2) Passenger forecast – Planning Section, Train Operation Dept.
Stations are tentatively located on the location map according to passenger estimations. Forecasts of passenger volume are made based upon the day and night populations within 1 km. on each side of the planned railway and the usage share against near-by transportation facilities.

(3) Specific Project Planning and Cost Calculation
Sales plan – Planning Section, Traffic Dept.
Construction plan – Planning Dept., New Line Construction Bureau
Lot procurement plan – Same as above
Train operation plan – Planning Section, Train Operating Dept.
New rolling stock plan – Planning Section, Rolling Stock Dept.
Facility and equipment plan – Maintenance Dept. and Electricity Dept.
Personnel plan – Personnel Dept.

(4) Financial Plans
Funding and fund procurement plans – Finance & Accounting Dept.
Overall revenue and expenditure calculation and adjustment – Planning & Research Dept.

The scheme of the project to be presented to the Ministry of Transport, is to contain the following items and forms:
- Total budget amount
- Investment method
- Starting, terminating and passing points of the planned line
- Gauge and power source
- Rough estimates for the sectional costs of construction
- Rough estimates on the first-year revenue and operating expenditures
- Passenger volume estimates
- Tentative location map and tentative railway design drawings, 1/500, sectional and vertical

The following steps are taken to obtain an operation permit from the Government:

(1) Upon approval at the Authority's Board of Directors meeting the scheme for promotion of the undertaking is submitted to the Railway Supervision Bureau of the Minister of Transport, who examines the scheme from the various points of view and orders specific improvements, if necessary.

(2) The final scheme, as approved by the Railway Supervision Bureau in accordance with the discussions between the Bureau and the Ministries concerned such as Finance, Construction and Home Affairs, will be sent to the Traffic Council for deliberation. As soon as the scheme is approved by the Council, the Minister of Transport grants a license for operation.

The application for a construction permit is to be submitted within one year after the business permit is obtained. The TRTA department in charge of the application is the Planning Department of the New Line Construction Bureau, which is to research carefully problems relating to the construction technique when preparing the application. Also, more detailed drawings under the scale of as large as 1/200 are required.

3.1.3 Making-up The First-Year Construction and Operating Plans (Period Planning Stage)

(1) Once the business and construction permits are granted by the Government, the Authority begins the construction work. First, they make up the first-year plans for construction and operation of the licensed line as well as the detailed construction work schedule. The Planning & Research Dept. compiles all of the periodic investment budget, while Financial Dept. is responsible to make up annual expenditure budget. Both departments provide guidelines for budgeting, if necessary.

(2) Part of the investment funds may be supplied from Government funds. The Planning & Research Department will apply for such Government funds to the Railway Supervision Bureau according to the decision by the Authority's Board of Directors. The Planning & Research Department also coordinates with the Finance & Accounting Department in preparing the next-year budget based upon the results of the Government fund application. The next-year budget plan will be brought to the Board of Directors meeting for approval, then to the Authority's Supervisory Commission for final approval.

3.2 Rate Revision (see Figure AII.3)

3.2.1 Long-Term Forecast for Revenues and Expenditures

Once a.year, the Planning & Research Department of Authority compiles the revenue and expenditure forecasts for the next 10 years. This happens in February when they know the year's accomplishment in comparison to the annual projection which is based upon the national economic forecast by the Government, the increased rate of wages due to the annual spring time general labor offensives and the Authority's revenue and expenditure budget for the next business year. According to this forecast, they calculate the break-even period with the current tariff rates and report to the management who decides whether or not and when the current rates should be increased, consulting with Ministry of Transport officials and any other parties concerned.

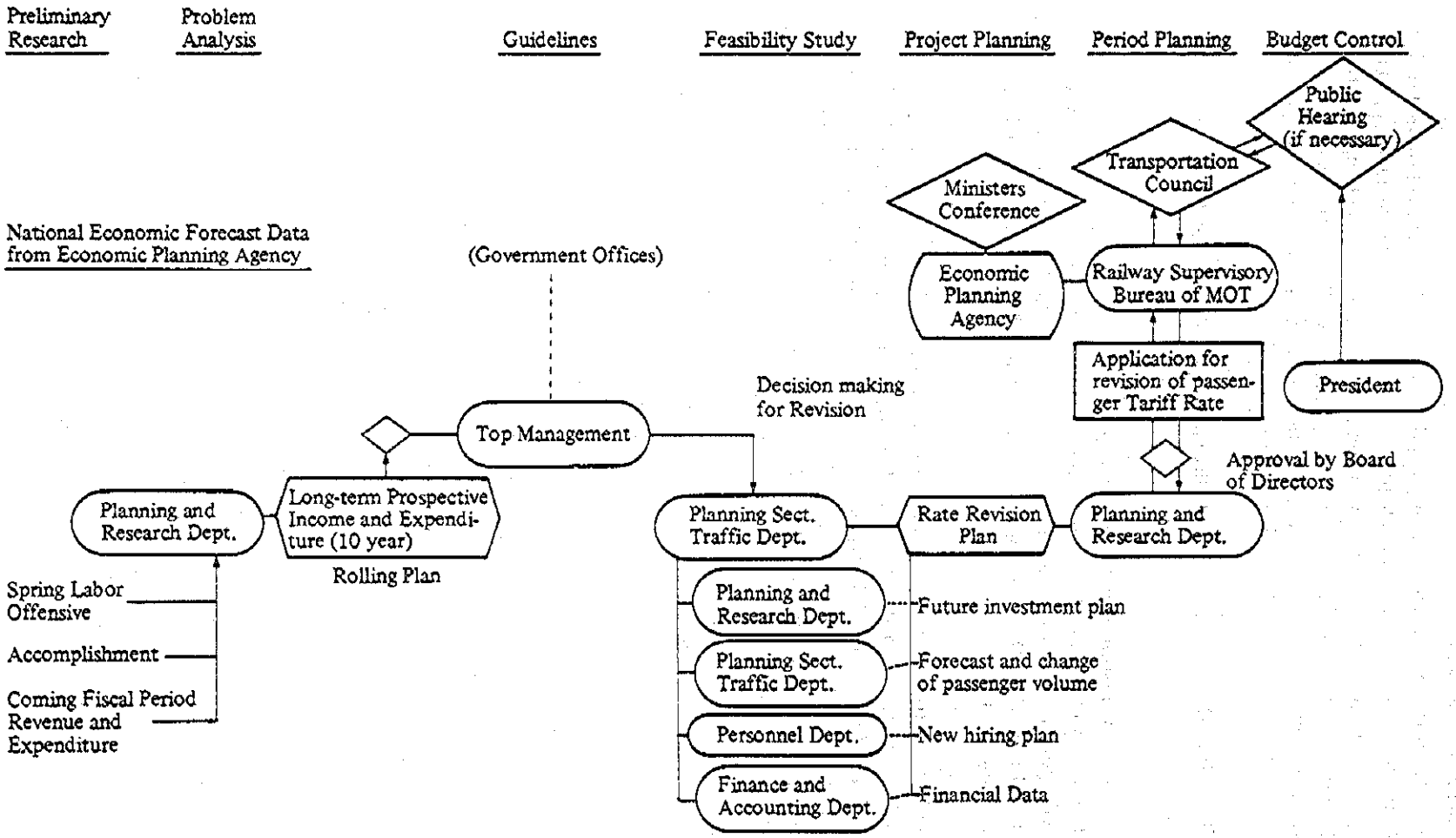


Fig. AII.3 Rate Revision

3.2.2 Change in Passenger Volume

The rate revision plan in the Authority is mainly handled by the Planning Section of the Traffic Dept., which starts planning by figuring the changes in passenger volume for each operating line, which might be caused by the rate increase. The volume of passengers who change to other means of transportations due to the rate increases may vary according to the overall share of commuting passengers which the subway line serves and to the degree competitiveness with other transportation.

The Section will conduct thorough research on this factor referring to the data obtained from past experiences.

3.2.3 Applications for Approval of the Rate Revision

The Planning Section of the Traffic Dept. completes the application form for passenger tariff rate revision based upon the data on future investment plans, schedules for new hiring and various financial data submitted by the Planning & Research Dept., Personnel Dept. and the Finance & Accounting Dept.

The complete application form, after the consent of the Board of Directors' meeting, will be filed with the Railway Supervision Bureau of the Ministry of Transport, which passes the application on to the Traffic Council for deliberation and consulting with the Economic Planning Agency which is concerned about consumer price index fluctuations. The Council may request a hearing with President of the Authority. The final approval for the revision will be given after discussion is made at the economic ministers' meeting.

APPENDIX III

A CASE STUDY OF RESEARCH AND PLANNING FUNCTIONS (2)
– Kokusai Denshin Denwa Co., Ltd. (KDD) –

1. OUTLINE

1.1 Establishment and Objectives

Established in April 1953 under the specific law which created this company, KDD is a private company registered on the stock market in Japan. The company however, in the nature of its business as a public common carrier has been controlled under the supervision of the Posts and Telecommunications Ministry of Japan.

The reason why the Japanese Government transferred all international telecommunication business to such a private company at that time, was that it would be easier for a private enterprise to adopt its operations elastically to different countries, different in social framework and technological achievement levels.

Capital and Investors:	16.5 billion yen as of March 31, 1978
	Finance companies 64% (approximately)
	Other corporations 25%
	Individuals 11%
	(None of the shares are owned by the Government)
Directors:	17 directors 3 auditors
	Directors and auditors are selected by the shareholders and should be approved by the Minister of Posts and Telecommunications
Personnel:	Approximately 6,000 as of March, 1978 (About 75% were men)
Characteristics:	(1) A private company monopolizing international telecommunication services in Japan
	(2) Approximately 90% of the users of its services are non-individuals
	(3) Frequent international cooperation in services and technology is necessary
	(4) The company must always be ready to adopt innovational technological developments and to expand into new services.

1.2 Outline of the Business

The telecommunication services of KDD are divided into two major categories: telegraph services (over 50% of sales), and telephone services (under 50% of sales). The latter has gradually been catching up the former.

Main Services

International Telegraph	International Telephone
International Marine Radiotelegraph	International Marine Radiotelephone
Aircraft Operating Agency Message	Maritime Satellite Telephone
International Phototelegraph	International Television Program Transmission
International DETEL	International Aeronautical Radiotelephone
International Leased Circuit	Leased Telephone Facility
	Program Transmission

KDD is now providing the following facilities as the mean of telecommunication systems:

A. ASatellite communication
B. Submarine cable communication
C. Scattered wave communication
D. High frequency radio communication

A and B are the most commonly used. Sometimes these two systems are used jointly between countries with which Japan has a large volume of telecommunications.

1.3 Historical Background

April 1953	Established by the special law
Sept. 1956	International telex service was begun, gradually overcoming high frequency radio
June 1964	Trans-Pacific cable was opened between United States and Japan
January 1967	Satellite Communication was begun between the United States and Japan, by means of the INTELSAT II
July 1969	The main line of international telecommunications connecting Japan with Europe was completed
August 1969	Automatic operation for the international telex to the United States and Canada was begun (the percentage of automatic operation at present is as high as approximately 98%)
May 1972	KDD took over international telecommunication business from Okinawa
March 1973	International subscriber dialing service was begun
June 1974	KDD Building was constructed, centering many functions and equipment together
March 1976	The second Trans-Pacific submarine cable was laid
October 1976	East China Sea cable communication was opened
April 1977	Started telephone and telex communication service with ships in navigation through the use of a satellite.
August 1977	A new submarine cable for connecting Okinawa-Luzon-Hong Kong was completed

1.4 Financial Review

¥million ($thousand)

	1977	1967	1957	(1977)/(1967)
Sales	107,110 (535,550)	20,567	5,457	(5.2)
Recurring profit	22,175 (110,875)	6,696	716	(3.3)
Income after tax	9,223 (46,115)	4,134	336	(2.2)
Total capital	157,998 (789,965)	37,197	8,991	(4.3)
Employees	5,758	4,073	3,399	(1.4)

1.5 Outline of the Organization

Personnel distribution:

Telephone and Telegraph Office (14)	3,832	4,305	6,098
Transmitting and receiving stations	473		
Head Office	1,381		
Research and Development Laboratories	154	1,793	
Research and Training Institute	65		
Payment Office	193		

Organization Chart

Attached as Figure A III.1

Numbers in the chart indicate the number of staff belonging to the group

Background of Personnel

The number of engineers among newly employed staff is twice the number of new non-engineering staff.

2. ORGANIZATION AND FUNCTION OF RESEARCH & PLANNING DEPARTMENTS

2.1 Departments in charge of Research and Planning

The center of the research and planning function at KDD is the General Planning Office and the Management Research Office, for which organization and staffing are shown in the Organization Chart. (Figure AIII.1)

2.1.1 Management Research Office

Management Research Office is the information center of KDD where all relevant information, domestic and foreign is collected (a part of the internal information via the Business Computerization Dept.). The information thus collected is analyzed, translated, processed, and edited here for integration into an appropriate information format, then distributed to each department as deemed necessary or published externally (as in the annual report). In addition, the Management Research Office, voluntarily or upon request of other departments, conducts research activities and sometimes dispatches its staff abroad to conduct surveys on telecommunication business activities in foreign countries.

As in cost analysis, some information is analyzed and checked by the section in charge of management analysis to be used for corporate planning. The other section of the office is in charge of internal auditing. In short, the Management Research Office is to be totally in charge of the "see" function in the management process, whereas the General Planning Office is to be in charge of the "plan" function.

2.1.2 General Planning Office

The General Planning Office is the division which undertakes the overall planning function of the company including long-term outlooks and project plans (centralization of planning function). It consists of four departments of 60 staffers, some of whom are technological staff. This office is capable of performing demand forecasting, technical calculation, economic evaluation, and even negotiation in overseas countries at a planning stage, thus taking a leading planning

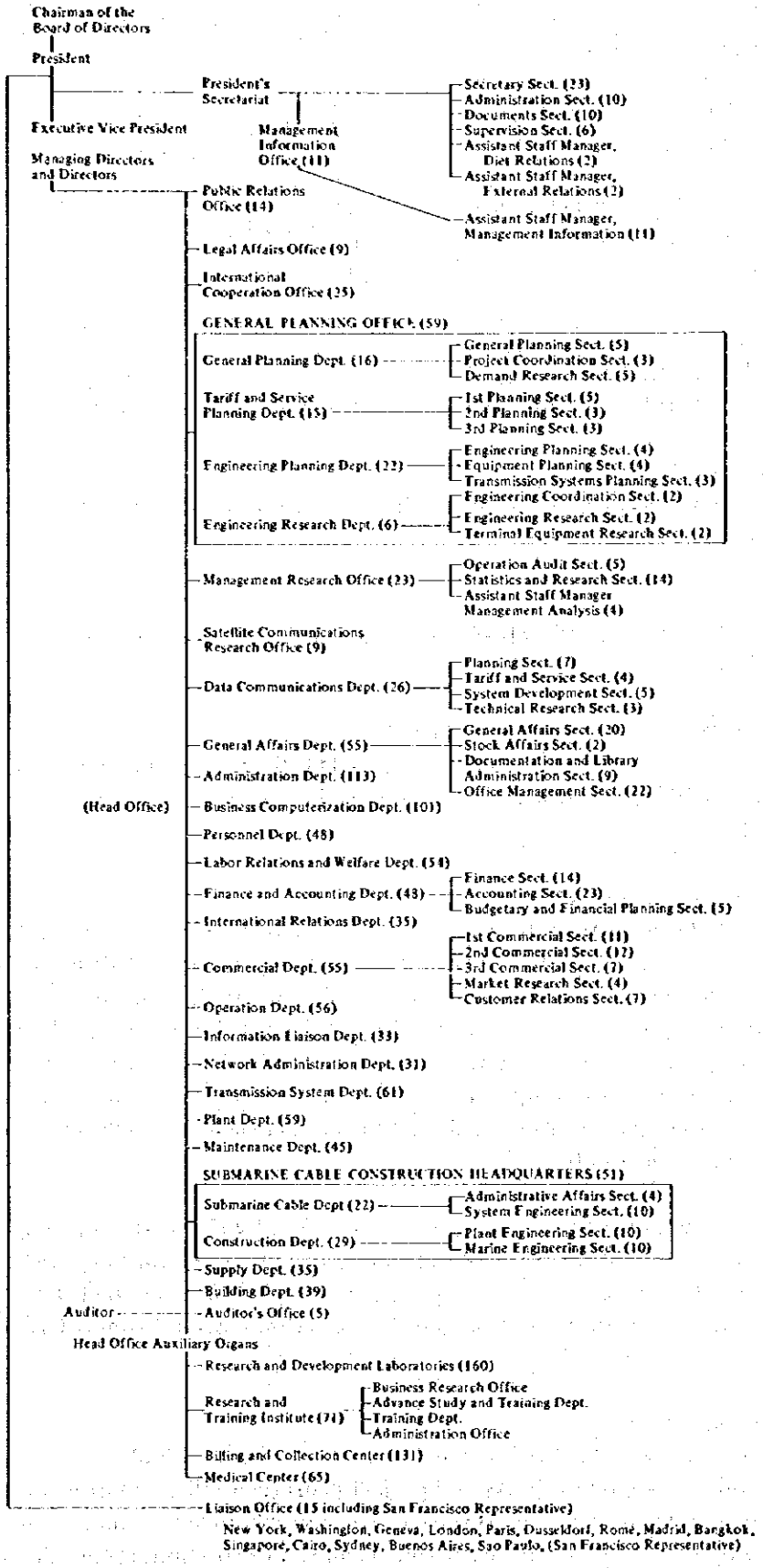


Fig. AIII.1 Organization of KDD (Departments in the Head Office)

position in the company.

Although, the Submarine Cable Construction Headquarters and the DATA Communication Dept. that were branched off from this Office have a limited scope of planning function, in that they only perform as a proxy of the General Planning Office, as far as basic plans and project plans are concerned.

2.2 Organizational Position

2.2.1 Relationship with Other Departments

Both the General Planning Office and the Management Research Office are one of the departments of the head office in the organization chart of KDD. However, the two offices are actually above the other departments taking a closer position to top management. Especially, the General Planning Office is given relatively strong authority in the operation of the organization. Their position can be compared to a general operation headquarters in the army. The relations of the General Planning Office and the Management Research Office with other departments of the company are shown in Figure AIII.2.

The General Planning Office obtains necessary information from the Management Research Office and other departments, hears views of related departments and works out a general plan and project plan to be submitted to the director in charge, vice president and president for their approval.

When approved, the Manager of the Planning Dept., on orders from the directors, is able to make a "request of execution" of the project directly to the executing department concerned and also assumes a steering function during the project execution.

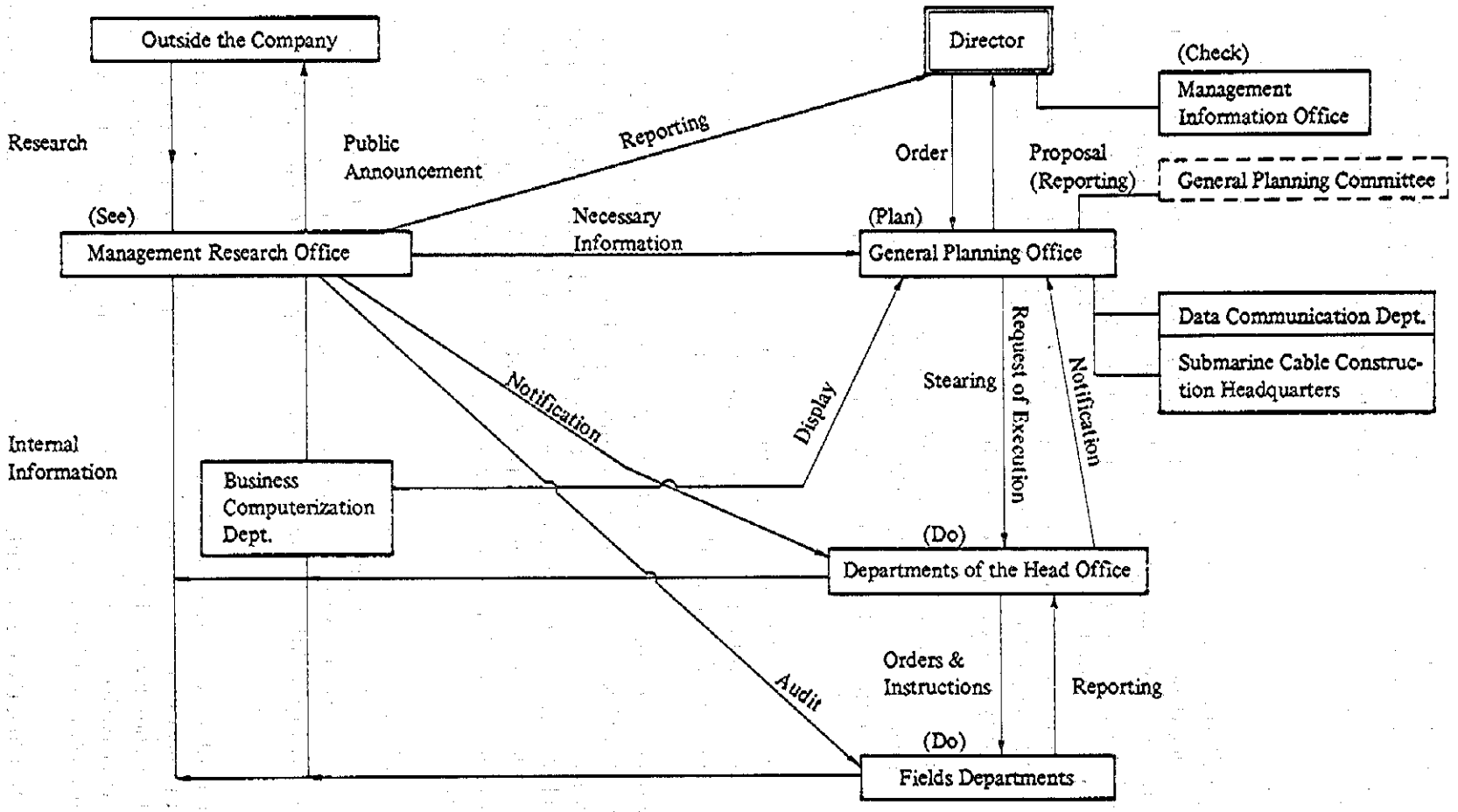
It can be said that KDD has constructed a powerful top-down planning mechanism. While the General Planning Office has been granted powerful authority, a checking mechanism is also installed. The check is made by the Management Information Office (11 staff) of the President's Office. Upon special instruction from the president and directors, the Management Information Office deliberates on detailed plans worked out by the General Planning Office, thus protecting the president and directors from being absorbed too deeply into a plan and also helping them make a prompt decision.

2.2.2 Organizational Changes

It took about ten years before a planning mechanism to KDD was established. Let us briefly look at a part of the reorganization process in terms of the nature and position of the planning function in the company. Figure AIII.3 shows three stages of the planning function of KDD for the past ten years.

(1) First period, up until ten years ago: The planning function was shared by two departments; Planning Dept. and Engineering Dept. (with plans finalized by the Planning Dept.). These departments were of a section level and were partly engaged in daily work, with resultant poor planning capability. They tended to wait for plans from the execution department. It was almost impossible for them to work out a long-term outlook from a broad point of view.

(2) Second period: In 1968, the Office of Planning Staff Managers was organized. It was aimed



NOTES: (1) This picture shows the management cycle of plan-do-see in the organization.
(2) Although the General Planning Committee is not an official organization, it helps adjust or establish the consensus of the view of the General Planning Office.

Fig. AIII.2 Position of Research and Planning Departments

at having exclusive staff for planning near the top management and executing the longer-term outlook in a top-down style. For this purpose, the Office was staffed by 45 experts of section chief level and above. Planning was divided into 30 fields (e.g., wages, technical standards) so that each field was taken care of by one expert. The staff were essentially free of routine work and they performed as if they were special assistants to the directors in the respective special fields.

First period – Period of Planning Dept. and Engineering Dept. (before March 1968)

Planning Dept. (22 staff)	Planning Section (10)	Long-term outlook demand forecasting
	Billing Section	Sales plan
	Research Section	Statistical survey
Technical Dept. (20 staff)	Technical Research Section	
	Technical Planning 1st Section	
	Technical Planning 2nd Section	
	Ultra-short Wave Construction Section	

Second period – Period of the Office of Planning Staff Manager (1968~1971)

		(Staff Manager)	(Assistant Staff Manager)
Director in charge of corporate planning	(Office of planning) (Staff Managers)	Liaison of corporate plans	Liaison of corporate plans/long-term corporate outlook
		Foreign country	ICSC/I.T.U./foreign enterprise
		Service	System/facility/quality/rate
		Personnel	Welfare/efficiency&wages
		Finance	Movable assets/immovable assets/business analysis
		Legal	Regulations/legal affairs
Director in charge of technical planning	(Office of planning) (Staff Managers)	Liaison of technical plans	Liaison of technical plans/long-term technical plans
		Control	Research and study/technical standard
		Electric wave	Frequency/wireless communication
		Wider band communication	Submarine cable/satellite communication
		Telegram	Telegram/data communication/telex
		Telephone	Telephone/television

Third period – Period of the General Planning Office (until present)

See Figure AIII.1

12 managers, 30 asst. managers, 5 others, totalling 47

Fig. AIII.3 Changes in the Planning Function

Since these staff had no subordinate, they felt as if they were to "think and plan alone", with such results:

1) Due to a too exact sub-division of work, the Office lacked integrity and mobility as a planning department.

2) Their draft plans were not precise enough and there a duplication of planning work by the execution departments often occurred.

3) Accordingly, the Office of Planning Staff Managers could not perform its duty to lead the execution departments from a broad point of view.

(3) Third period: To remedy these shortcomings the present set-up of the General Planning Office was introduced in October, 1971. Major changes were as follows:

1) The organizational position of the planning department was equalized to the departmental level and moreover, it was made possible for the General Planning Office to have integrated draft plans.

2) The General Planning Office covers basic policy, long-term prospects and planning work of project plans, while departmental execution plans are under the jurisdiction of each execution department.

3) In order to facilitate prompt decisions and execution of project plans, the planning department manager is authorized to submit a draft plan directly to the directors and to make a "request of execution" directly to the execution division within the scope of authorized plans. The Management Information Office was newly established on a checking mechanism.

2.3 Assignment of Work in the Research and Planning Departments

The method of doing work in the Research and Planning Dept. varies according to the nature and scope of the work and project. The details are explained later in this report in relation to a case study. Assignment or work to each section is shown below. This includes sections of the General Planning Office, Data Communications Dept., Management Research Office, and Management Information Office.

Hereunder is shown a general rule of doing work in the General Planning Office which takes a central part of the research and planning work.

(1) Surveillance of trends of the business environment and demand
(2) Establishment of corporate targets and basic policy
(3) Working out, project plans or work plans
(4) Adjustment
(5) Reporting to top management -- Receipt of execution order
(6) Steering of the project

Table AIII.1 Assignment of Work to Sections of the Research and Planning Departments

A. General Planning Office

(1) General Planning Dept.

In charge of overall long-term outlook of the company

General Planning Section

Section chief	(1)
Asst. chief	(4)
Total	5

All (N)

(1) General adjustment of long-term forecasting of communication business
(2) Long-term financial forecasting
(3) Basic policy of communication network
(4) Long-term outlook of international telecommunications
(5) Promotion of plans under its jurisdiction
(6) Miscellaneous affairs of the Dept.

Project Coordination Section

Section chief	(1)
Asst. chief	(2)
Total	3

All (N)

(1) Basic policy of project plans
(2) Drafting of special project plans
(3) Promotion of project plans

Demand Research Section

Section chief	(1)
Asst. chief	(1)
Researcher	(3)
Total	5

All (N)

(1) Long-term demand forecasting
(2) Drafting of long-term circuit outlook
(3) Basic policy of market development
(4) Promotion of plans under the jurisdiction

(2) Tariff and Service Planning Dept.

Individual service plans

1st Planning Section

Section chief	(1)
Asst. chief	(1)
Researcher	(3)
Total	5

All (N)

(1) Long-term sales prospects
(2) Basic policy regarding existing services (excluding picture communication service)
(3) Basic policy on service quality standards
(4) Basic policy on billing and rates of existing service
(5) Basic policy on revision or abolishment of terms and conditions for providing existing service
(6) Basic policy on consignment of existing service
(7) Promotion of plans under the jurisdiction
(8) Miscellaneous affairs of the Dept.

2nd Planning Section

Section chief	(1)
Asst. chief	(2)
Total	3

All (N)

(1) Basic policy on introduction of new services (excluding picture communication service)
(2) Basic policy on billing and rates on new services
(3) Establishment of terms and conditions for providing new services
(4) Basic policy on consignment of new services
(5) Promotion of plans under its jurisdiction

Note: (E) Engineering staff
(N) Non-engineering staff

3rd Planning Section

Section chief	(1)
Asst. chief	(1)
Researcher	(1)
Total	3

All (N)

(1) Basic policy on establishment or revision of picture communication service (facsimile, View-Data)
(2) Basic policy on tenns and conditions for providing the above
(3) Revision of billing and rates for the above
(4) Promotion of plans under its jurisdiction

(3) Engineering Planning Dept.

To help establish various plans from a technical point of view and set up plans for facilities and equipment

Engineering Planning Section

Section chief	(1)
Asst. chief	(3)
Total	4

All (E)

(1) Drafting a prospect of long-term communication network
(2) Long-tenn prospect of R&D (including establishment of laboratories, establishment of research themes)
(3) Project plans based on the plan under its jurisdiction
(4) Basic policy on technical matters
(5) Basic policy on introduction of new technology
(6) Technical matters relating to new service
(7) Liaison with Nippon Telephone and Telegram Corp. on technical matters of consigned work
(8) Circuit information system
(9) Promotion of plans under its jurisdiction
(10) Miscellaneous affairs of the department

Equipment Planning Section

Section chief	(1)
Asst. chief	(1)
Researcher	(2)
Total	4

All (E)

(1) Long-term forecasting of equipment
(2) Long-term forecasting of utilization of equipment
(3) Project plans based on the plans under its jurisdiction
(4) Basic policy on establishment of equipment
(5) Basic policy on utilization of land and buildings
(6) Promotion of plans under its jurisdiction

Transmission Systems Planning Section

Section chief	(1)
Asst. chief	(1)
Researcher	(1)
Total	3

All (E)

(1) Prospects on transmission equipment
(2) General adjustment of matters relating to transmission system plan and circuit network plans
(3) Project plans based on the plans under its jurisdiction
(4) Promotion of project plans (excluding the plans under the jurisdiction of the Project Coordination Section of the General Planning Office)
(5) Promotion of plans under its jurisdiction

Engineerings Coordination Section

Section chief	(1)
Asst. chief	(1)
Total	2

All (E)

(1) Promotion of the plan of international dial telephone
(2) Handling of industrial porperty and technical information
(3) Basic matters on permission of patents and inventions
(4) Technical guidance for external institutions and joint research with them
(5) Technical standards, specifications, etc. (excluding those under jurisdiction of other departments)
(6) Integrated control standard of computer systems
(7) Integrated utilization of computer systems
(8) Establishment and control of technical standards

(4) Engineering Research Dept.

Technical research on new service and new terminal apparatus

Engineering Research Section

Section chief	(1)
Asst. chief	(1)
Total	2

All (E)

(1) Research on technical matters relating to new business
(2) Promotion of the plan under its jurisdiction
(3) Miscellaneous affairs of the department

Terminal Equipment Research Section

Section chief	(1)
Asst. chief	(1)
Total	2

All (E)

(1) Research on new terminal equipments
(2) Introduction of new terminal equipment
(3) Promotion of plans under its jurisdiction

B. Data Communication Dept.

A project team for data communication business. Draft plans are to be submitted to the General Planning Office

Planning Section

Section chief	(1)
Asst. chief	(1)
Others	(5)
Total	7

(N) = 4 (E) = 3

(1) Long-term forecasting of data communication, Making of project plan and operation plans.
(2) Making of basic policy on providing data communication service and general adjustment
(3) Miscellaneous affairs of the department

Tariff & Service Section

Section chief	(1)
Asst. chief	(1)
Others	(2)
Total	4

(N) = 4

(1) Tariffs and system of data communication
(2) Sales of data communication service

System Development Section

Section chief	(1)
Asst. chief	(1)
Senior staff	(1)
Others	(3)
Total	6

(N) = 2 (E) = 4

(1) Basic policy of data communication system and equipment
(2) Introduction of data communication systems
(3) Operation of equipment of data communication
(4) Technical standard of data communication equipment
(5) Development and trial of data communication systems

Technical Research Section

Section chief	(1)
Asst. chief	(1)
Others	(1)
Total	3

(N) = 1 (E) = 2

(1) Adjustment of data communication
(2) Introduction of new technology of data communication
(3) Negotiation with Nippon Telephone and Telegram Corp., etc. on technical matters in relation to new data communication

C. Management Research Office

Holds "see" function of plan-do-see cycle and also function of statistical surveys.

Operation Audit Section

5 staff

All (N)

(1) Internal audit plan
(2) Internal auditing
(3) Liaison and adjustment in relation to audit by the

	comptroller
	(4) External auditing
Statistics and Research Section	(1) Research on the state of telecommunications
Section chief (1)	(2) Editing and publication of books on telecommunications
Asst. chief (1)	(3) Editing and publication of company history
Others (10)	(4) Control of statistical reports
Total 12	(5) Work on statistical data
All (N)	(6) Maintenance and improvement of statistical system
	(7) Miscellaneous affairs of the department
Management Analysis Section	(1) Management analysis
4 staff	(2) Cost accounting
All (N)	

D. Management Information Office

1st Section	(1) Research on important matters in relation to management policy
2nd Section	(2) Disposal of special matters consigned by top management policy
3RD Section	(3) Measures in relation to deliberation of important matters
Total 11 staff	(4) General adjustment of various projects
(N) = 6 (E) = 5	

3. CASE STUDY

In order to study the in-house process of project planning more specifically, in relation to KDD's other departments, as well as to the supervising government offices, the following two cases were chosen from their past projects:

(1) Construction of Japan-Korea Submarine Cable Systems
To study the planning process of a big facility investment project.

(2) International Facsimile Telegram Service between Japan and the United States
Mainly to study the process of rate establishment

Table AIII.2 Construction of Japan-Korea Submarine Cable System

(1) Demand Forecast	
Urgency ranking	General Planning Dept. (Demand Research Sect.)
Five-year demand	General Planning Dept. (Demand Research Sect.)
Long range demand (25 years)	General Planning Dept. (Demand Research Sect.)
Circuit capacity required	General Planning Dept.
Section of communication method	General Planning Dept.
(In-house consensus)	
Necessity of constructing new cables	General Planning Dept. → Director in charge
(2) Sounding on the counterpart's intentions for the project	
Demand estimates	General Planning Dept. → International conference between the countries involved

(3) Preliminary Research	
Data collection	General Planning Dept. ← Management Research Office
Investment fund search	General Planning Dept. ← Management Research Office
(In-house consensus)	(Inter-departmental meeting → Directors' meeting)
(Basic plan, rough estimate on construction cost, funding plan, etc.)	
(Explanation to the Ministry of Posts and Telecommunications)	(General Planning Dept. → Director in charge)
(4) Negotiation on construction and maintenance agreement	
↓	
(Adjustment and renegotiation)	
↓	
Conclusion	
Necessary circuit capacity of cables	General Planning Dept.
Land location	General Planning Dept.
Timing of construction	General Planning Dept.
Systems design and calculation of construction cost	General Planning Dept. ← Submarine Cable Construction Headquarters
Material procurement plans	General Planning Dept. ← Submarine Cable Construction Headquarters
Share and funding method of construction and maintenance costs	
(In-house consensus)	
All above items and economical efficiency	(General Planning Dept. Director's meeting)
(5) Feasibility Study	
Submarine survey	Submarine Cable Construction Headquarters
Technical survey	Submarine Cable Construction Headquarters
Economical efficiency study	General Planning Dept.
(6) Draft of Int'l Construction & Maintenance Agreement	
All items in Step (4) and others	Int'l Relations Dept. Legal Affairs Office
(Written decision)	
Report → Approval	(General Planning Dept. ⇄ Director's meeting
Assignment	
(7) Application for Government Validation	Int'l Relations Dept.
Prior to the application, the project was explained to the supervising officer in the Ministry of Posts and Telecommunications	
(8) Execution Plans	Departments in charge
Purchasing plans for lots, office equipment and facilities.	
Personnel planning	
Fund procurement plan	
(9) Execution of Project	
Promotion and coordination	General Planning Dept. (Project Coordination Sect.)

Note: In the Japan-Korea Submarine Cable System case, it took 18 months from the beginning, (1) Demand Forecast, to application for Government validation.

3.1 Construction of Japan-Korea Submarine Cable Systems

Communication between Japan and Korea has depended on scattered waves and partially satellite circuits. The negotiations for a new submarine cable system between Japan and Korea started sometime in 1977. At present the feasibility study has been completed and the project is "go" with the total budget of 6.5 billion yen (for the submarine portion only), to be completed in May 1980, a detailed explanation of the each planning step as follows:

3.1.1 Demand Forecast

The Demand Research Section of the General Planning Dept. constantly follows and forecasts the changes in demand of each communicating country for 2 ~ 3 years in advance in preparation for the expansion plans. In the case of Japan-Korea Submarine Cable Systems they have to have a long-range forecast up to 25 years ahead because the submarine cable is designed to last for at least 25 years. To do so, they first run a 5 year demand research project based on past records, the Government forecast of future economic trends, import/export statistics between the two countries as the leading indicator etc., and forecast demand for the rest of the period according to the data obtained.

When a prediction of the total communication capacity required is obtained, it is split into satellite systems and submarine cable systems so that they may have an alternative when either one of the two systems is out of order. Based on the allocated capacity, the number of cable circuits required will be determined. The Section informs the results to the Directors and other Sections of the Department to obtain their consensus as to necessity of constructing new cables.

3.1.2 Preliminary Research

Once the in-house consensus is obtained, the General Planning Dept. runs preliminary research on the under-water conditions between the two countries, etc., obtaining necessary data from the Management Research Office. According to these research results, the Department, after discussions with other departments concerned, refers the project to the directors' meeting. At the same time, they sound out their counterpart in the other country, on their intentions on the project.

3.1.3 Negotiation on Basic Conditions

If the project is confirmed by both KDD's management and its the counterpart, negotiation on the cable construction planning starts between the two countries to determine the following items:

(1) Capacity and location of the cable circuits and timing of construction (minimizing of the gap between the demand forecasts of the two countries is necessary).

(2) Total construction budget and its share by each country, and which country supplies the construction materials.

(3) Pattern of ownership for the cables and method of bearing the maintenance costs.

KDD's department in charge of the negotiations is the General Planning Dept., which refers computation of the construction budget, etc., to the Submarine Cable Construction Headquarters.

After a certain period, the negotiations will be brought to tentative conclusion by the two countries. The conditions may be adjusted according to the results of the submarine research during the feasibility study to follow. The General Planning Dept. will then submit the basic conditions agreed upon to KDD's directors' meeting with the analysis on the economical efficiency. The basic conditions will also be informed to the Ministry of Posts and Telecommunications to keep them advised.

3.1.4 Feasibility Study

Feasibility of the project under the tentative conditions is checked by the departments in charge. The study includes a submarine survey by the Marine Engineering Section of the Construction Dept., Submarine Cable Construction Headquarters, and economical efficiency evaluation by the General Planning Dept.

Thorough field research is performed from KDD's research ship to survey the ocean current, temperature, sea-bottom condition, etc., around the area. (One survey voyage costs about one hundred million yen.) The economical efficiency of the project is studied for a pay off by at least 10 years. The final step of the feasibility study is compilation of the project plan according to the data obtained.

3.1.5 International Agreement and Government Validation

According to the basic conditions agreed and the results of the feasibility study, the International Relation Dept. prepares a draft of the construction and maintenance agreement to be concluded between the counterparts. At this stage the Legal Affairs Office may be contacted for assistance. Signing of the agrement is subject to approval by the Governments of both countries. In this case, the agreement was concluded between KDD and the Korean Government itself. Once the agreement is concluded, the International Relations Dept. submits the application for the Government validation for execution of the project, to the Ministry of Posts and Telecommunications.

3.1.6 Project Execution Plan and Coordination Work

At KDD, as soon as the agreement is concluded, the written decision of the project will be presented to the Executive Vice President and then to the President through the director in charge and the project is officially assigned to the Manager of the General Planning Department upon approval by these executives. He will send the official letters of request for execution of the project to these departments.

Each department in charge prepares annual plans in accordance with their assignment under the project and requests budget allocations. Though these transactions the General Planning Dept. is responsible for promoting the project and ccordinating and controlling the departments conerned.

3.1.7 Inter-departmental Meetings

At each planning step discussed above, a meeting of the departments concerned will be held from time to time to obtain in-house consensus of opinion. In addition, the General Planning Office maintains the general planning board as an informal plans board. Board meetings will be held as required,while the other departments such as Finance & Accounting, Labor Relations & Welfare, etc. will be invited to the meeting if necessary.

3.2 International Facsimile Telegram Service Between Japan and the United States

Since Japanese letters are essentially ideographs just like Chinese characters, it is quite inconvenient to send messages through telecommunication lines by converting it into alphabetical letters encoded into electric pulse. Facsimile service has great advantages to send messages and pictures as they are between long distances in real time basis.

However, the problems of facsimile have been quite costly because of the information sent will be quite voluminous compared with telegrams.

3.2.1 Research and Development of Terminal Equipment

– Engineering Planning Dept.
– Technical Development Sect., Research & Development Lab.

Around 1968 a research theme, "Development of Terminal Equipment for Effective Use of the Communication Circuits", was adopted by the Engineering Planning Dept. as one of the KDD's R&D plans and assigned to the Laboratories. Sometime in 1972, as the result of their continuous R&D efforts, the laboratories succeeded in developing a fast process facsimile with effective compression of information to be transmitted. Since the new facsimile developed, which was more advanced than any other facsimile then in existence anywhere, was expected to pass the ITU (International Telecommunication Union) Standards, AT & T became interested in Japan-U.S. facsimile service using this new equipment. Therefore, KDD started planning the project. The process is explained below.

3.2.2 Cost Calculation and Rate Establishment

– Tariff and Service Planning Dept.

This Department estimates the total cost required to start the new type communication service including equipment costs, personnel costs, etc. They further compute the yearly cost and the cost per unit of service, assuming the reasonable period of pay-off, terms and conditions to the users. Based upon the above data, rates for the new service are established. Also taken into consideration are existing terms and conditions of KDD's other communication services, quality of the new service, comments of the counterpart communication company and making the new rate competitive and favorable to the users.

3.2.3 Demand Research

– Demand Research Section, General Planning Dept.
– Market Research Section, Commercial Dept.

First, computation will be made to obtain sufficient annual revenue and demand volume so as to cover the projected yearly costs. In order to see if the demand volume estimated is actually available under the tariff rate established above, demand research will be conducted according to the following procedures:

The Demand Research Section in the General Planning Dept. estimates potential demand from new customers and current users who may switch all or part of their needs to the new communication service. The Market Research Section, Commercial Dept., conducts the field market study to confirm the above potentiality estimate. They interview corporate users by random-sampling to check the need for the new service and customer intention to change to the new service. The data obtained will be tabulated and analyzed, and a decision will be made on the feasibility in holding the necessary volume of demand by the Demand Research Section. The counterpart company will handle the demand research within their country.

3.2.4 Assignment of Projects

– Second Planning Section, Tariff and Service Planning Dept.

Results of the demand research will be sent to the 2nd Planning Section in the Tariff & Service Planning Dept., which prepares the written decision on the new communication service describing:

(1) Candidate counterpart and its country
(2) Terms and conditions to users
(3) Tariff rate and the basis of calculation
(4) Departments in charge
(5) Number of personnel and its cost required
(6) Equipment cost
(7) Profitability including the sales projection

At this stage, the Section requests advice or suggestions from the Engineering Planning Dept. and the planning board of the General Planning Office whenever it is necessary. The written decision will then be presented to the Director in charge or the President for approval, and the project will be officially assigned to the Manager of the Tariff & Service Planning Dept.

3.2.5 Reporting to the Ministry of Posts & Telecommunications

– Manager, Tariff & Service Planning Dept.

The Manager of the Tariff & Service Planning Dept. will immediately explain the outline of the project to the electric communication supervising officer of the Minister's Secretariat, Ministry of Posts and Telecommunications and obtain his verbal approval for entering into negotiations with the counterpart. This action also serves as a "warming-up" for the official application for Government validation to follow.

3.2.6 Negotiation with the Counterpart

– International Relations Dept.

The major items to be negotiated with the counterpart are as follows:

– Tariff rate
– Method of facility and equipment acquisition
– Available circuits

3.2.7 Application for Government Validation

– Int'l Relations Dept.

The International Relations Department then obtains Government approval on the new communication service, tariff rate to be applied and international agreement concluded between the two countries.

3.2.8 Execution Planning

(1) Equipment and systems

– Service and control location	Equipment Planning Sect.
– Number of equipment required	Equipment Planning Sect.
– Selection of int'l communication circuits	Transmission Systems Planning Sect.
– Purchasing plan of terminal equipment	Terminal Equipment Sect.
– Selection of suppliers and contractors	Supply Department
– Maintenance plan	Maintenance Dept.

(2) Starting plans

– Application manuals	Tariff & Service Planning Dept.
– Maintenance manuals	Maintenance Dept.
– Personnel training	Ability Development Sect.
– Canvassing plan	Commercial Dept.
– Negotiation with the labor union	Labor Relations & Welfare Dept.

The project was completed and the facsimile service between Japan and the United States was inaugurated in January 1978.

APPENDIX IV REFERENCES ON ORGANIZATION BUILDING

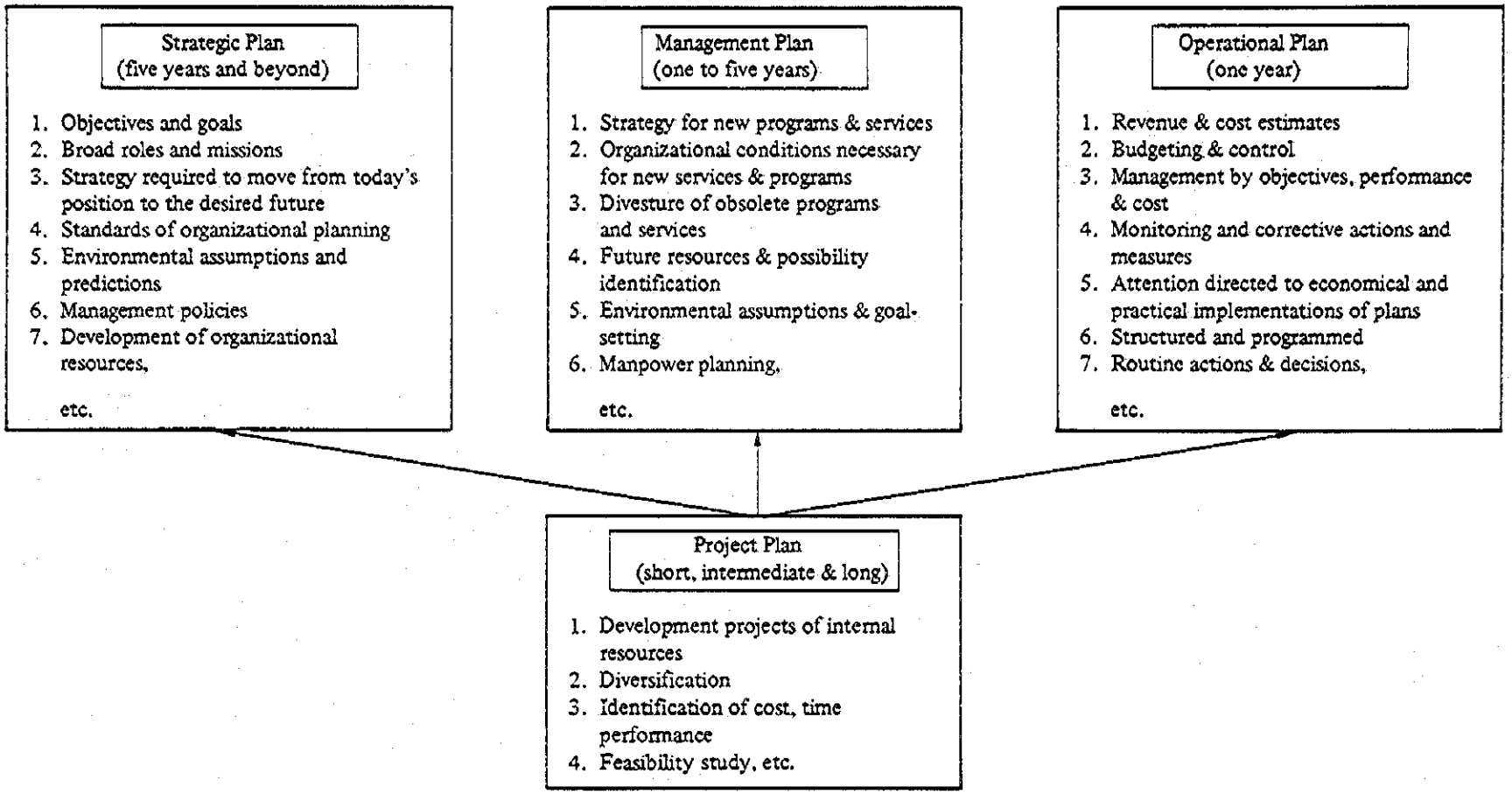
(1) United Nations Publications

1. Standards and Techniques of Public Administration, 1951
2. A Handbook of Public Administration; Current Concepts and Practice with Special Reference to Developing Countries, 1961
3. A Handbook of Training in the Public Service, 1966
4. United Nations Programmes in Public Administration, 1967
5. Measures for Improving the Performance of Public Enterprises in Developing Countries, 1969
6. The Administration of Organization and Methods Service, 1969
7. Interregional Seminar on the Use of Modern Management Techniques in the Public Administration of Developing Countries, 1971
8. Development Administration; Current Approaches and Trends in Public Administration for National Development, 1975

(2) Other Related Publications

1. Fred W. Riggs, Administration in Developing Countries, Boston; Houghton Mifflin, 1964
2. R.P. Rynton and U. Pareek, Training for Development, Illinois; Richard D. Irwin, Inc. 1967
3. James C. Charlesworth, ed., Theory and Practice of Public Administration: Scope, Objectives and Methods, Philadelphia, 1968
4. Richard Beckhard, Organization Development: Strategies and Models, Reading, Mass., Addison-Wesley, 1969
5. Newton Marglulies and Anthony P. Raia, Organizational Development; Value, Process and Technology, New York: McGraw-Hill, 1972
6. Kenneth J. Rothwell, ed., Administrative Issues in Developing Countries, Lexington Books, 1972
7. Glenn H. Varney, An Organization Development Approach to Management Development, Reading, Mass., Addison-Wesley Co., 1976

APPENDIX V(a) A SYSTEM OF PLANS



APPENDIX V(b) DECISION PROCESS AND TYPE OF RESEARCH REQUIRED

	Problem Identification & Setting	Management Task Definition	Solution Finding	Implementation Control
Types of Management Needs, Questions & Activities	1. To set the purpose & the basic end 2. To formulate goals explicity 3. To clarify the assumption 4. To set priorities 5. To delineate conflicting goals, etc.	1. Identification of specific problems to achieve the goals 2. To find the conditions that must be changed 3. Search for major factors that account for the problems 4. Degree of difficulty in achieving the objectives 5. Requirements of course of action, etc.	1. Identification of alternatives 2. Priorities of choices 3. Degrees of feasibility 4. Cost/benefit of solutions 5. Impacts of a choice 6. Selection of an optimum decision 7. Methods of implementation and planning, etc.	1. Establishment of monitor, follow-up and control policies and measures 2. Policies of projects and problems 3. Technical, schedule, cost & funding status and control problems 4. Discovery of delays & deficiencies and methods of corrective actions, etc.
Types of Research Needs, Questions & Activities	1. Fact findings 2. Information gathering 3. Exploration 4. Trend identification 5. Review of the latest events & reports 6. Discovery of symptoms of the problems, etc.	1. A diagnostic research 2. Uncovering the cause of unsatisfactory conditions 3. Descriptive & analytical research 4. Identification of major factors & variables 5. Forecasting analysis 6. Status report 7. Analysis reports, etc.	1. Business economic studies 2. Operations research 3. Feasibility studies 4. Cost/benefit analysis 5. Policy analysis reports 6. Management strategy reports 7. Management actions reports, etc.	1. Management science studies 2. Project & program control studies 3. Management decision reports 4. Program evaluation & review technique (PERT) studies 5. Project status reports, etc.

APPENDIX VI LIST OF ORGANIZATIONS AND STAFF OF THE TRAINING PROGRAM

Name	Address	Telephone Number
Japan International Cooperation Agency (JICA)	Shinjuku Mitsui Bldg., 2-1, Nishi-Shinjuku, Shinjuku-ku, Tokyo	(03) 346-5311
Ministry of Transport (MOT)	2-1, Kasumigaseki, Chiyoda-ku, Tokyo	(03) 580-3111
Port and Harbor Research Institute Ministry of Transport (PHRI)	3-1-1, Nagase, Yokosuka-shi, Kanagawa Pref.	(0468) 41-5410
Universities (KYOTO University)	Yoshida-Honmachi, Sakyo-ku, Kyoto-shi	(075) 751-2111
Mitsubishi Research Institute (MRI)	1-6-1, Otemachi, Chiyoda-ku, Tokyo	(03) 214-5531
Japan Maritime Research Institute (JMRI)	Kai-un Building 2-6-4, Hirakawa-cho, Chiyoda-ku, Tokyo	(03) 265-5231

APPENDIX VII THE FIRST YEAR TRAINING PROGRAM SCHEDULE IN JAPAN

(1) General Schedule

A General Outline of Training Program in Japan; Orientation Course of Training Program

Duration: 27~29 September
Place: KEIDANREN HALL, Tokyo
Institute: Staff of Mitsubishi Research Institute (MRI)

Curriculum No. 1

An Introduction to Maritime Transportation

Duration: 2~13 October
Place: Japan Maritime Research Institute (JMRI), Tokyo
Institute: Staff of JMRI

Curriculum No. 2

An Introduction to Basic Mathematics, Statistics, and Computer Programming

Duration: 16~28 October, and 28 November~2 December
Place: Port and Harbor Research Institute, (PHRI) Yokosuka
Institute: Staff of PHRI

Curriculum No. 3

Basic Methodologies for World Economy, Trade and Transit Analysis and Forecasting

Duration: 6~24 November
Place: KANSAI Training Center, Osaka
Institute: Professors of Kyoto, Kagawa and Okayama Universities

Curriculum No. 4

Exercises for Transit Forecast and Project Evaluation

Duration: 4~15 December
Place: Mitsubishi Research Institute (MRI), Tokyo
Institute: Staff of MRI

Curriculum No. 5

Workshop of Job Initialization of the Economic Unit

Duration: 18~26 December (including the last orientation instructions)
Place: Olympic Memorial Youth Center (O.M.Y.C.), Tokyo
Institute: Staff of MRI

Extra-curricular Activities

Fields Trips

Duration: 30 October~2 November, 25 ~ 27 November
Place: HIROSHIMA, KOKURA, Visiting the KANMON Straits, SHIMONOSEKI Harbor, KITAKYUSHU Harbor
Institute: Sponsored by Japan International Cooperation Agency (JICA)

(2) Daily and Weekly Schedule

In principle, the following is the daily and weekly schedule:

1) Daily: Morning Session: 10:00 a.m.~12:00
Lunch Time Recess: 12:00~1:30 p.m.
Afternoon Session: 1:30 p.m.~4:00 p.m.

2) Weekly: Saturdays (with some exception) and Sundays are day-offs.

APPENDIX VIII TRAINING INSTRUCTIONS

INSTRUCTIONS

(1) Participants are requested to observe the training program schedule.

(2) It is urged that rules and regulations set forth by JICA will be carefully abided by.

(3) For each training curriculum, it is requested that participants follow the instructions given to them by the training staff members in charge of the program.

(4) It is strongly advised that participants will spend a couple of hours each day on supplementary and preparatory review of the subject under study.

(5) It is urged that whenever questions arise pertaining to the training program participants should feel free to consult with the persons in charge.

(6) It is requested that assignments given to any of the curriculum subjects during the training period in Japan, and/or for the self-training program at the SCA, be faithfully completed as instructed.

(7) Life in Japan may be different in many respects and as the training program is very intensive and concentrated, one must take care of one's health.

(8) It should always be borne in mind that staff members of this training program will be available for whatever assistance may be needed. Please feel free to call upon the persons in charge whenever any problems arise.

(9) Lecture notebooks or training texts will be prepared on each training curriculum and distributed in advance to participants. It is advised that these materials should be kept in a personal file as a source of reference, because the official training texts to be printed later may not include all of the information written in the provisional texts.