

6.4 Training

6.4.1 Training Concept for P.T. Indosat Personnel

Training to be given by P.T. Indosat to its personnel is to provide them with the capability to accomplish their duties and the technological strength to fully process increasing international telecommunications traffic while meeting the rapid advances in technological development.

The personnel trained under this program will be the motive power to energetically carry out the long-term development plans towards 2000.

In reality, the employees of P.T. Indosat are generally young and have little business experience. This state of affairs is expected to continue for the time being as the hiring of employees continues.

P.T. Indosat's telecommunication plans call for the introduction of new services and technologies. For this reason, the largest task confronting P.T. Indosat is to develop these young employees as soon as possible.

Based on these circumstances, training programs should preferably consider the following four points:

- ① From the viewpoint of technological development, training by P.T. Indosat should be optimal to acquire these technologies.
- ② Effective training programs should be prepared to enhance the capability of young P.T. Indosat employees to accomplish their business as part of the programs to develop their skills.
- ③ Optimal training needed for effective utilization of employees should be planned.
- ④ Clear-cut training methodology shall be provided for developing P.T. Indosat employee skills in important job categories such as engineers, technicians, operators, and researchers.

6.4.2 Technologies Required for Technological Development

Telecommunications is the area in the industry in which technological innovation is most prominent. For this reason, studies of technological items needed in respective technological fields are desirable to acquire these technologies and utilize them to realize new services. This process will indicate the optimal training to be undertaken. Technologies common to the development of the technologies described in the master plan and those needed in individual technological fields are listed as follows:

(1) Common Technologies Needed for All Technological Fields

1) Computer Technology

Computers will be used in almost all communication equipment such as telephone, telex, and packet switching equipment. Computer hardware and software technologies will be needed for design and maintenance of telecommunication equipment.

Computers are expected to be used as principal components in international telecommunications in the near future, and the training of engineers in the following fields will be necessary before these technologies are introduced:

- ① Computer hardware technology
- ② Computer programming
- ③ Computer software technology

2) Network Control Technology

Increased international telecommunication traffic increases the number of international circuits and destinations. The international circuit configuration will become more sophisticated and complex. Furthermore, in Indonesia, a third gateway office will be built in addition to those in Jakarta and Medan, and network control will be the technology needed to provide good

services. Network control technology is also important to process calls during major failures of gateway offices and to back up circuits.

3) Digital Technology

Parallel with digitalization of transmission lines, all telephone and non-telephone services will be digitalized and will move towards ISDN.

Conventional MODEMs to translate digital signals into analog signals will become unnecessary by digitalization, and high speed signals of computers will be flowed to transmission lines directly. As such, digital technology will become the mainstream in all fields of telecommunications.

4) Quality Control Techniques

Higher reliability of telecommunications facilities will be required more as facilities have larger capacities and become more complex. The impact of a failure is serious when computers become more important in telecommunications facilities. For this reason, quality control techniques will become increasingly important in telecommunications facility design, failure management, etc.

(2) Technologies Needed for Individual Technological Fields

1) Satellite Telecommunications Technology

Contract services for a TDMA reference station and for TTC&M/IOT require a heavy responsibility different from conventional commercial satellite telecommunications services. For this reason, P.T. Indosat is required to thoroughly acquire the new technologies of INTELSAT.

2) Submarine Cable Technology

Analog coaxial submarine cables will be replaced by digital optical-fiber submarine cables in the future. By acquiring optical fiber technology, preparations for

installation of an optical-fiber submarine cable will become possible.

Indonesia has several cable installation plans centering on Medan, and acquisition of submarine cable technology utilizing cable installation work will be important.

Submarine cable technology requires such technologies as ocean surveys, cable installation, and overall transmission tests.

3) Switching Technology

There are extremely few engineers and technicians for telephone and telex switching, the main services of P.T. Indosat. Judging from the scale of switching equipment of Jakarta, Medan, and the third gateway office, a considerable number of switching engineers and technicians must be trained.

SPC (stored program control) system technology will be the main technology for future telephone switching, and also telex switching.

In switching technology, therefore, an accumulation of technology, such as practical knowledge and experience over a long period of time as well as acquisition of traffic theory, becomes the basis of technological development.

The common point between telephone and telex switching is that in both instances, computers are main equipment. Computer hardware, software, and programming technologies will be required as principal technologies.

4) Data Transmission Technologies

High-speed data lines are a useful transmission means to rapidly connect information of the No. 6 common signaling system of packet and telephone switching to computers in foreign countries.

For the moment, technology will be high-speed data transmission technology requiring analog/digital conversion.

In particular, high measurement technology to determine transmission quality by bit error rates is also required.

Table 6.4.2.1 shows each training program.

Table 6.4.2.1 Optimal Training for Technological Development

	Training Item	Description	Terms	Persons
Common Technology	Computer Technology	Basic computer technology Computer hardware Computer software Computer programming	4 w	20
	Digital Technology	Basic digital theory Digital signal process Synchronization Error control system Digital transmission	9 d	20
	Network Management	Basic mathematics Traffic theory International communication networks Emergency counter-measures for communications	9 d	10
	Quality Control Techniques	Basic quality control Service standards Equipment reliability standards	1 w	10
Technological Training	Satellite Communication	Basic microwave theory FDM-FM theory Design of satellite circuit Principles of PCM system Principles of TDMA system Outline of TTC&M Outline of INMARSAT	6 d	10
	Submarine cable	Outline of ocean survey Principles of system design Outline of laying works Principles of optical fiber	6 d	10
	Data Transmission	Outline of computer Switching system Protocal Data terminal Data network	2 w	10
	Telephone Switching	Network planning Network configuration Signalling system Outline of switching Outline of switching board Outline of computer Outline of electronic switching	2 w	10

	Telex Switching	Outline of computer Network, numbering Signalling system Outline of electronic switching Outline of Packet switching TELETEX VFT, TDM Traffic control	2 w	10
Business	Business Training	Outline of facilities Demand forecast International accounting Collection of charges Marketing Activities Outline of services	1 w	10

Each training will be done twice a year. Training can be conducted with internally-available lecturers, such as persons of planning section, or with trainers from outside. Computer training will be conducted with maker's assigned training.

6.4.3 Effective Training for Accomplishment of Duties

In addition to training to meet technological development, training of P.T. Indosat employees to enhance the ability to accomplish their duties should also be undertaken.

The proposed training includes the training of newly-employed personnel, OJT, foreign language training, hierarchical training, overseas study, and correspondence education and training, and all are important support for the accomplishment of duties.

(1) Training of Newly-Employed Personnel

Most of P.T. Indosat's personnel were hired upon graduation from school or are employees who left other private enterprises.

Their experience in international telecommunications is therefore not enough. Under these circumstances, it is important for P.T. Indosat to confirm their knowledge of company policies, vision, business, marketing, management, etc. to develop them. Newly-employed personnel must acquire knowledge of circuit configuration, equipment composition, operation and maintenance methods, etc. covering all aspects of the business.

(2) OJT

Routine guidance by superiors is important for the personnel to learn international telecommunications business and to become able to work on their own initiative without supervision.

(Training of this nature is called OJT (On-The-Job training).

During OJT, managers consciously develop their employees by giving good advice to increase their ability.

If OJT is undertaken thoroughly in all departments and sections, young engineers and personnel will willingly perform their work and will become the motive power of P.T. Indosat.

(3) Foreign Language Training

International telecommunications business is exposed to foreign countries and requires a high level of language ability.

Language capability makes a great contribution to P.T. Indosat in building its global position in international telecommunications.

It is recommended that young employees in particular be sent abroad for study and to language schools to improve their language ability.

(4) Hierarchical Training

The purpose of this training is to have employees of P.T. Indosat recognize the authority and responsibility of their ranks while accomplishing their duties. The training will be conducive to the smooth accomplishment of their duties.

The hierarchies can be classified into general staff, senior staff, supervisors, managers, and directors, and training should be undertaken for each hierarchy.

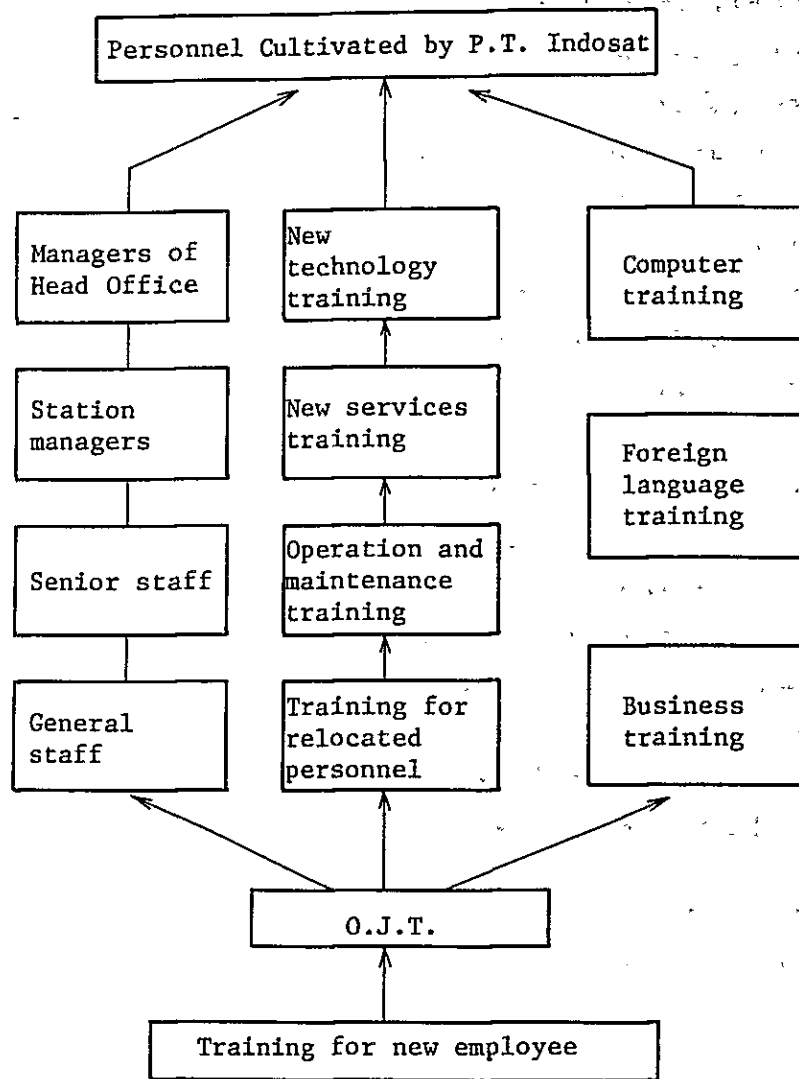


Fig. 6.4.3.1 Training System for P.T. Indosat

6.4.4 Cultivation of Personnel

To implement various parts of this master plan, such as new technologies and services, as well as the new Jakarta central office and the Surabaya third gateway office, the method (direction) for developing personnel to carry out these plans has to be made clear. Therefore, P.T. Indosat will study the method (direction) for cultivating personnel in the following job categories that will be important to P.T. Indosat:

- ① Technical personnel as a central force to carry out the plans
- ② Research personnel responsible for research and development of new technologies
- ③ Equipment and facility technicians responsible for telecommunication equipment and facilities that will become higher in standard and more complex
- ④ Telephone operators to process increasing telephone traffic
- ⑤ Cultivation of personnel with consideration of their educational career

(1) Cultivation of Engineers

The engineers of P.T. Indosat are graduates of universities in Indonesia or outstanding staff members hired from private enterprises. Staff with appropriate educational and business backgrounds are important as the central force in making and implementing plans.

In order for them to develop the ability to implement the plans, first of all, they should be assigned to field offices, such as the earth station, cable landing station, etc., and experience the mechanism of real international telecommunications.

In particular, employees fresh from universities should be given an opportunity to work in field offices for several years.

Engineers should be appropriately assigned to such fields as satellite communications, submarine cable systems, and

switching equipment. Experience in field offices equipped with computers will be very beneficial to design telecommunication equipment in the planning department and for technical negotiations with equipment manufacturers.

Engineers with field office experience should be re-assigned to the corporate planning and engineering department to be cultivated as key personnel in planning. Engineers with practical technical capability should be given an opportunity to work as research engineers. Engineers with some experience in engineering planning should be given a chance to again experience field business to refresh their ideas.

Figure 6.4.4.1 shows an example of technical personnel cultivation.

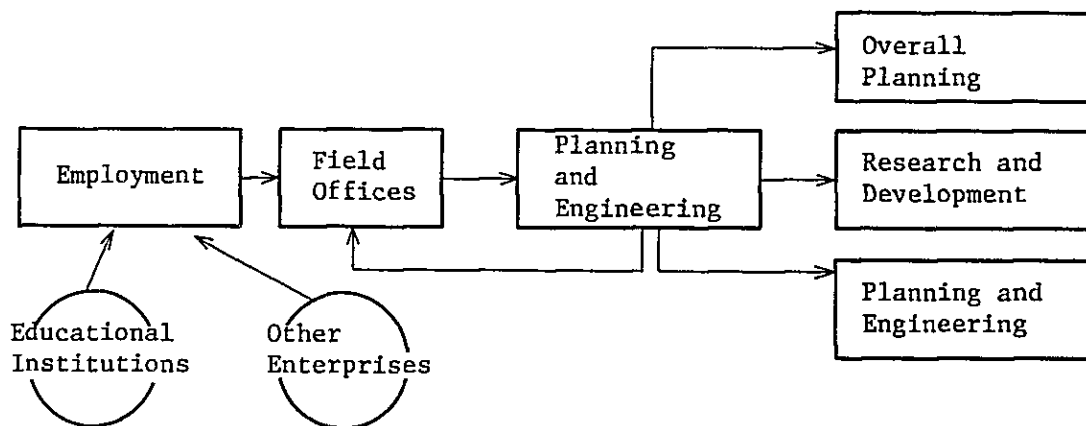


Fig. 6.4.4.1 Example of Cultivation of Engineers

Objectives for Cultivation of Engineers

The cultivation of engineers as mentioned above has the following objectives:

- ① To cultivate engineers who can independently carry out new technological development suiting the needs of Indonesia's international telecommunications.
- ② To cultivate engineers who can write specifications for required telecommunication equipment and who can take leadership in negotiations with equipment manufacturers.

- ③ To cultivate engineers who can sufficiently comprehend computer software and hardware technologies because technology centering on computers will be introduced.
- ④ To cultivate the technical capabilities of P.T. Indosat personnel on a par with that of PERUMTEL personnel as a technical interface with PERUMTEL's facility will increase through expansions in technology.
- ⑤ To cultivate young engineers who can be sent to international conferences such as CCITT, CCIR, INTELSAT, etc.

(2) Cultivation of Technicians

Technicians of P.T. Indosat are graduates of technical high schools and academies and those who have been hired from other enterprises.

Most important for these technicians is the enhancement of the technical power of the telecommunication equipment and circuits that they maintain. Proportionately higher technological power will be required as telecommunication equipment becomes more complex and computerized. In order to meet this requirement, whenever possible, P.T. Indosat should supervise telecommunication equipment and facility works and accumulate experience in these areas.

Many telephone and telex switching technicians are particularly needed as the Medan, Jakarta, and Surabaya offices are slated to open successively. Furthermore, a long time is needed to develop their skills, and a large number of preferably young staff members should be assigned.

Technicians principally run the field. Outstanding technicians should be given an opportunity to be relocated to the planning and engineering, and research and development departments.

Fig. 6.4.4.2 shows a method for cultivating technicians.

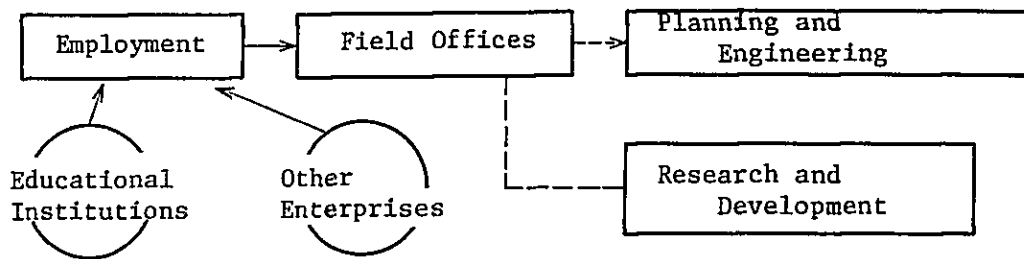


Fig. 6.4.4.2 Example of Method for Cultivating Technicians

Objectives for Cultivation of Technicians

- ① To cultivate technicians by enhancing their technical capabilities to permit them to quickly repair equipment failures.
- ② Large numbers of telephone and telex switching technicians need to be cultivated.
- ③ To cultivate technicians to be able to receive the high technologies for computer engineering.
- ④ To bestow technical capability fully capable of comprehending recommendations of CCITT and CCIR, and technical matters related to INTELSAT.

(3) Cultivation of Researchers

The technological development will proceed from digitalization to ISDN. The cultivation of researchers will be a task to research and develop new and future technologies.

If possible, outstanding individuals who have graduated from universities should be hired as researchers to contribute to the development of international telecommunications in the areas of basic, applied, new, and other technologies.

Researchers are required to always be aware of technological trends in and outside P.T. Indosat. Cooperation with universities and PERUMTEL as well as with research organizations of other private enterprises and foreign countries for technological cooperation should also be considered.

Fig. 6.4.4.3 shows an example of a method for cultivating researchers.

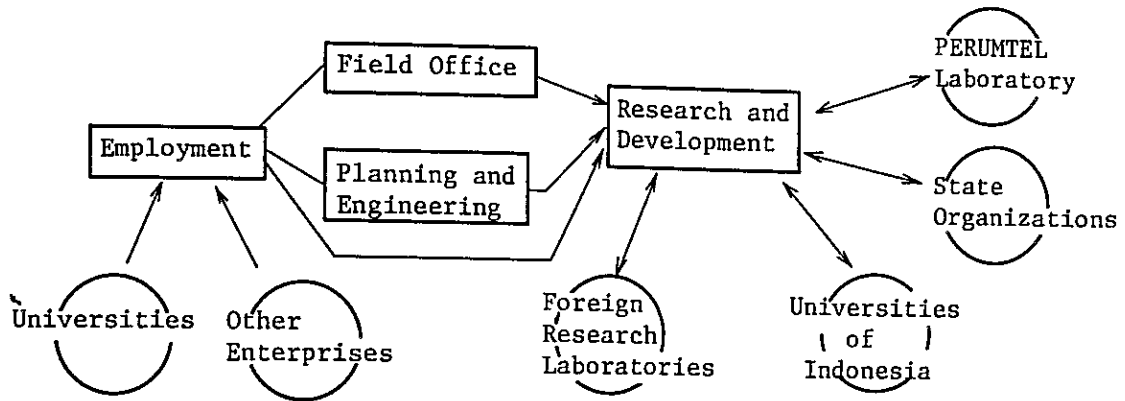


Fig. 6.4.4.3 Example of Cultivation of Researchers

(4) Cultivation of Telephone Operators

Reflecting the increase in traffic, the number of operator personnel in telephone offices is steadily increasing. By the year 2000, the number of telephone operators is expected to far exceed 1000.

Telephone operators should be given an opportunity to work in other jobs such as secretaries, sales, and charge clerks to demonstrate their abilities, instead of ending their lives as telephone operators. This will solve the problem of effective utilization of operator personnel and the appropriate relocation of the increasing number of operator personnel.

Fig. 6.4.4.4 shows an example of a method for cultivating telephone operators.

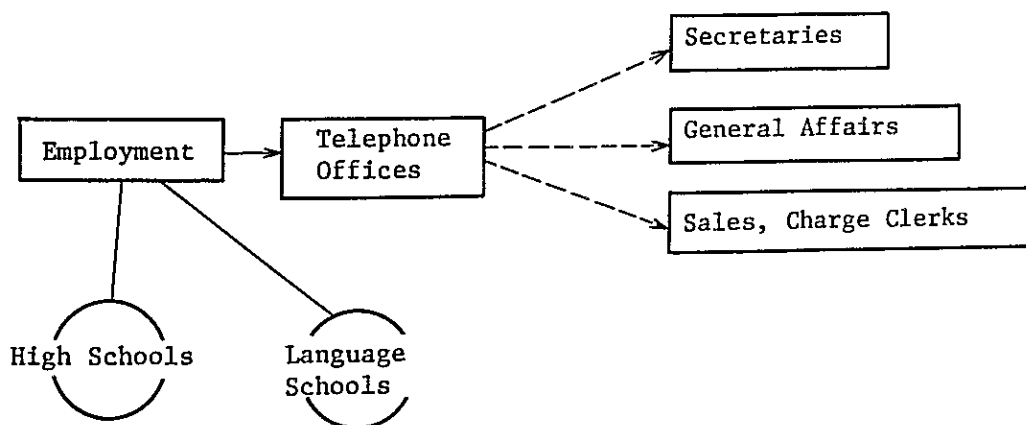


Fig. 6.4.4.4 Example of Cultivation of Telephone Operators

(5) Cultivation of Programmers

It will not be too long before computers are used in all aspects of P.T. Indosat's business. Computers will be installed not only with telecommunication equipment and facilities, but also with streamlined utilization of various types of information processing such as personnel, payroll, and charge information.

In-house programmers should be cultivated to introduce and operate computers for these purposes to facilitate the smooth introduction of computers.

All young employees should be taught to acquire common knowledge of computers.

6.4.5 Implementation of Training

For effective implementation training should be well planned. Particularly, training for the introduction of new services or technology needs full preparations, including the obtaining in advance of training personnel.

Fig. 6.4.5.1 shows a flow of jobs from the planning of training to its implementation. Among various trainings, some should be planned based on needs from inside and outside the company and the others should be included in a long-term program.

The training implementing section assesses the feasibility of these trainings plans the contents and structure, and decides dates, lecturers, trainees, facilities and places.

It is then decided whether to rely on an outside party for their implementation. A training program should be drafted together with facility and business expansion programs and its importance will increase further.

Training can be conducted with internally-available lecturers. However, it is desirable to use trainers from outside the company to gain additional input and stimulus.

It is necessary to hear from the participants in training their opinions and utilize them for the next training.

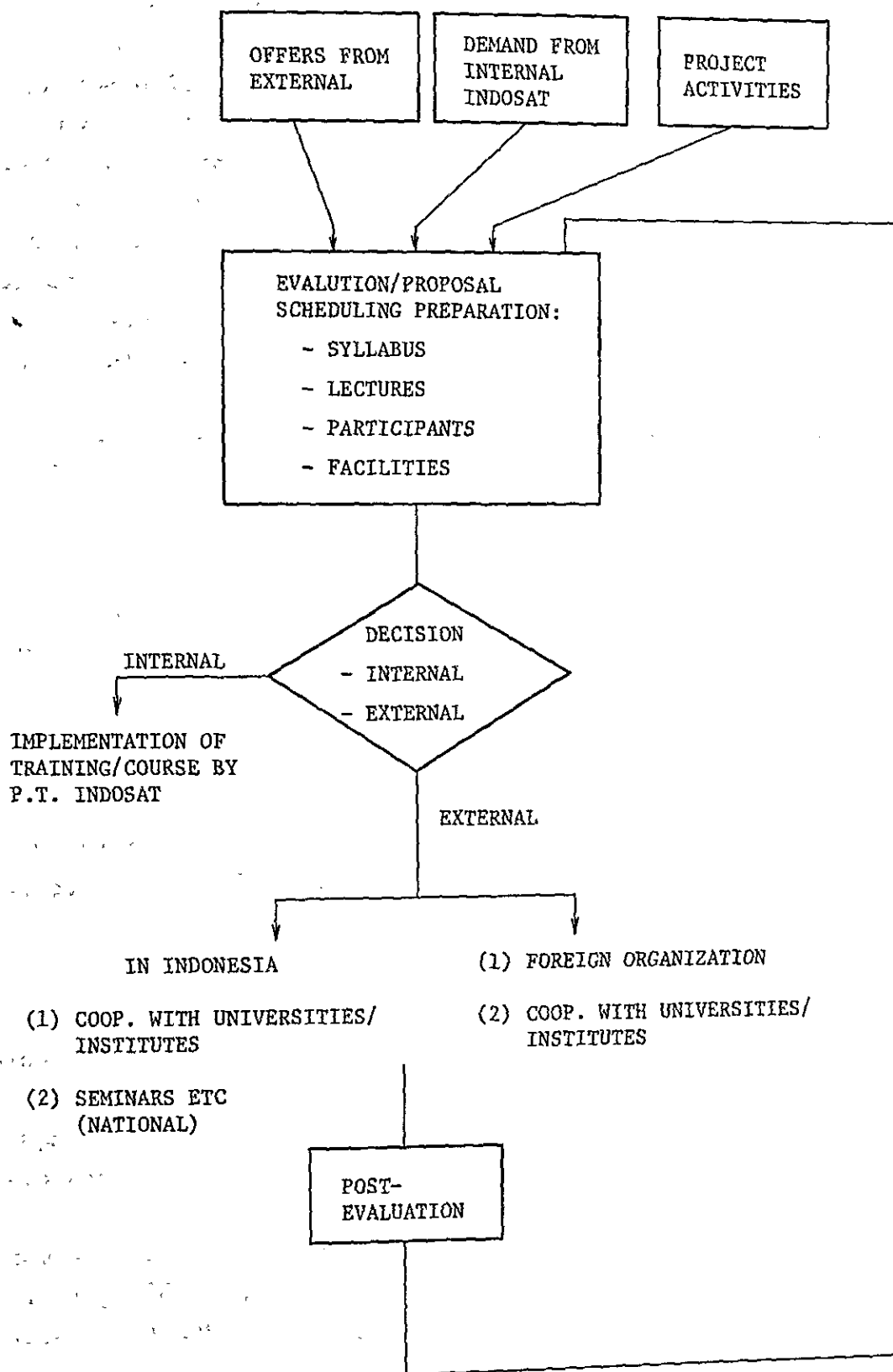


Fig. 6.4.5.1 Implementation Flow of Training

6.4.6 Training Center

Since its independence from PERUMTEL, P.T. Indosat has been carrying out workshop trainings mainly with its own facilities and lecturers. Because it has no training center of its own. However, there are many factors lying ahead in the future, such as the increasing traffic of telecommunications, the introduction of more advanced and sophisticated communications facilities, and needs for telephone station operators and new personnel, which urgently require P.T. Indosat to equip itself with its own training center to raise and cultivate personnel. The training center will contribute to the development of international telecommunications.

(1) Organization of Training Center

The training center will come directly under the administration of the head office's training section (to be established by 1986) and be responsible for the implementation of the company's programs. It will be staffed with several employees who implement and supervise training and keep the management of facilities needed for it.

Further in the future, when it will have become fully fledged in various aspects, the training center will have its own lecturers or trainers.

(2) Function of Education and Training Center

It is desirable to give the education and training center the functions of providing facilities and enabling both lectures and practice for general basic technical trainings as well as the training of new recruits, telephone operators, telex operators and other personnel.

The education and training center may also have its own accommodation facilities to allow trainees to live together and heighten the sense of unity through their frank exchange.

(3) Location of Education and Training Center'

As the temporary location of the education and training center, the new central station (new building) in Jakarta is considered appropriate. However, it is desirable to build the education and training center together with recreational facilities in the suburbs of Jakarta. In the future, Center will present the employees of P.T. Indosat a place to train themselves both intellectually and physically.

(4) Educational and Training Facilities

To make education and training there effective, the education and training center requires to be equipped with various training facilities.

The recommended training facilities include:

1) Audio-Visual Training Facilities

Among these are an LL (language laboratory) system various projectors and videotape recorders, which can be utilized for language lessons as well as technical and customer service training.

2) Communications Simulation Facilities

These are training facilities which can be used to train newcomers or personnel rotation personnel by making it possible to simulate the existing telecommunications facilities in use.

Training facilities which cannot be accommodated at the education and training center because of their space or service requirements may be kept at operating stations as spares and utilized when they are required for training.

Main training facilities

- a) Carrier terminal equipment
- b) Microwave facilities (including satellite communications facilities)
- c) Data communications facilities

- d) Telephone and telex service facilities and switchboards (simulators)
- e) International telephone switchboard
- f) Manual telex switchboard

3) Facilities for Basic Technical Training

As telecommunications technology makes rapid, steady progress, and becomes more and more sophisticated, it is important to let the employees of P.T. Indosat master basic technology in the field.

- a) Basic digital technology training facilities
- b) Micro-computers
- c) Educational and training-purpose computer systems

CHAPTER III

7



7. Maintenance and Operation

7.1 Maintenance

Facilities applied new technology are to be introduced into Indonesia's international telecommunications network. These will be further updated by addition of new technologies to introduce new services. Adequate maintenance is therefore required to maintain the high level of service quality to the satisfaction of its customers by extracting the full capabilities of these facilities, and by keeping the reliabilities of ensuring maximum reliability throughout the communications system.

Although the installation cost of the future facilities will decline relative to the size of the facilities so added, labor costs will climb with the future expansion. The introduction of computer technology, however, will enable some automation, which will help compensate minimizing such labor cost increase with comparatively low cost.

P.T. Indosat should therefore proceed with the automation of maintenance and the structuring of a streamlined maintenance system to enable the company to maintain sound management, to provide stable high quality services and to make future investments according to strategic plannings.

7.1.1 Steamlining of Maintenance Organization

(1) Strengthening Maintenance Control Department in Head Office

P.T. Indosat will have several operating stations. To standardize the quality of maintenance operation at individual stations to an appropriate level for improvement of overall company maintenance efficiency, the maintenance control department should be strengthened. This department will be responsible for establishing both the maintenance system, and the criteria for determining the maintenance plan. The system and its criteria so established will be subject to periodical review based on actual maintenance experience and technical

trends. The skills and data regarding maintenance accumulated at the maintenance control department will help with designing the new system.

(2) Rationalization of Maintenance Center

The Cable Landing Station, Satellite Earth Station, Transmission Center, Switching Center, etc. will be also function as maintenance centers. High reliability electronic components will be used for the telecommunications facilities; a redundant system structure will be adopted to ensure high reliability overall. The introduction of computers will provide effective automatic monitoring of the telecommunication facilities. Such technical advances and improved reliability will enable the remote monitoring and remote operation of the facility, which consequently will allow these maintenance centers to be consolidated. These consolidated centers can be either unattended, or staffed at a minimum personnel level. The consolidation of the centers will also allow for the effective assignment of maintenance personnel, floor space saving, reduction of the cost of introducing automation, through efficient utilization of maintenance facilities, etc. In addition, the mode of maintenance can be advanced from equipment-by-equipment level to overall communication system level to improve the compatibility of the maintenance system with the generation of IDN and ISDN.

The maintenance centers should be provided with a maintenance interface station complying with CCIR and CCITT* recommendations.

* CCITT Rec. Series M, N, O
Rec. R 71

7.1.2 Maintenance Control

(1) Facility Control

Facility Control Files listing the historical record, configuration, function, etc. of all the facilities should be kept for their effective utilization, maintenance, expansion

and new construction based on complete understanding of present status of the entire telecommunication system. An efficient facility file control system must be established for fast reference and for prompt updating of information according to the changes made to the facilities from time to time.

(2) Software Control

It is expected that software-dependent telecommunication facilities will be introduced increasingly often. The functional modifications and expansions of these facilities can be made simply by changing the software. However, the software will have to be modified in many occasions after the facility has been put to commercial use due to frequent debugging for correcting the software anomalies. Efficient software control will be required therefore for easy modification of the software in order to maintain consistent functioning of the system.

The followings should be taken into consideration when establishing a software control method:

- (i) From the standpoint of the telecommunication carrier providing services, control over auxiliary off-line systems should be neglected or downgraded.
- (ii) Software consists of a program and office data. It will be sufficient to control only the application program for users in the off-line system programs. For the on-line system constituting the major portion of the telecommunication services, all the programs should be subject to control. All the office data should be controlled regardless of on-line or off-line.
- (iii) The type and quantity of memory devices which record the software should be determined. The quantity should include those to be stored in remote locations, for emergencies.
- (iv) The format of the documents describing the software should be specified, e.g. program list, D.F., D.F., etc.

- (v) Handling procedures of the memory devices and documents which must be revised with updating the software should be determined.

(3) Document Control

Control of the documents pertaining to the telecommunication facilities should be improved for efficient and correct maintenance operations. These should always be consistent with the functions and conditions of the telecommunication facilities and compatible with the contents of other documents.

(4) Failure Control

(a) Establishing Failure Handling Procedure Flow

A failure handling procedure flow should be determined in advance to ensure prompt restoration actions if any breakdown should occur. The services provided by a computer dependent telecommunication system may be seriously affected unless restoration is carried out in exact sequence as a small local failure could lead to breakdown of the entire system or take excessive repair time. Consequently, the system must be fully provided always with a correct maintenance and operations manual. A notification and report system for failures which might seriously affect the services should be determined for prompt and effective actions to be taken in such events.

(b) Failure Control

Reasonable failure control should be carried out in order to establish effective measures for the maintenance of an effective level of operation, through the evaluation of the qualities of the telecommunication facilities and of the maintenance level.

The following factors will be set for the control:

$$\text{Availability} = \frac{\sum u}{(u + d)} \times 100 (\%)$$

where, u: undisturbed time
d: disturbed time

$$\text{MTBF} = \frac{\sum t}{n} (\text{H})$$

where, MTBF: Mean Time Between Failure
t: time operated
n: number of failures

$$\text{MTTR} = \frac{\sum f}{n} (\text{H})$$

where, MTTR: Mean Time of Trouble Restoration
f: time for restoration
m: number of failures

Control standard values will be determined according to the above control factors. Such standard values will be corrected from time to time according to actual experience. When the control factor of an individual facility does not meet the control standard necessary, action should be taken by tracing the cause thereof.

(5) Spare Parts Control

Ensure full control of spare parts. Review periodically the quantity on hand, future requirements estimated through actual experience, lead time, and manufacturing trends of suppliers, to ensure that the optimum quantity and types of spare parts are on hand.

7.1.3 Maintenance Operation

The mode of maintenance operations will change pace with the technical advance of the telecommunication facilities. Constant efforts will be required therefore in such an environment to study the maintenance methods suitable for each prevailing situation to ensure effective maintenance. When analyzed with current technical trends taken into consideration, maintenance can be divided into the categories described below.

The expression "effective maintenance operation" as used herein will mean the maintenance operation in which the total amount of the work done in each categorized item to attain a required level of reliability would be kept to minimum. Consequently, the optimum distribution of work to each item will be necessary.

(1) Preventive Maintenance

Preventive maintenance is important maintenance work to forestall the occurrence of failures. Equipment subject to preventive maintenance has been greatly reduced in number since a large number of high-reliability electronic components and devices have started to be used in communication equipment compared with equipment that used mechanical parts and vacuum tubes. Redundant preventive maintenance rather causes the component reliability to decrease and artificial failures related to maintenance work and thus cannot be considered at all useful. The necessity and period for preventive maintenance on equipment must be decided after closely studying the characteristics and functions of the composite components. Generally, the following equipment requires preventive maintenance.

- (i) A facility having parts prone to mechanical wear.
- (ii) A facility having parts with a fast deteriorating function.
- (iii) A facility obliged to perform preventive maintenance to comply with the laws and regulations or by an agreement with an outside organization.

(2) Post-Recovery Maintenance

This is maintenance work to restore a telecommunication facility to fully serviceable condition after initial recovery of a failure has been done, and should be regarded as key work for future maintenance to prevent a recurrence and eliminate a potential weak point.

(3) Strengthening Maintenance

(3) Strengthening Maintenance

This is a maintenance work for improving, stabilizing, etc. the telecommunication facility function based on the evaluation of the failure control results, and should be performed according to appropriate standard.

(4) Installation Work

Installation work, such as new construction, expansion, replacement, and relocation of the communication facilities, should be subcontracted with P.T. Indosat maintenance personnel assuming the responsibilities for control and supervising such works.

(5) Subcontracted Maintenance

Where maintenance subcontracted to domestic business is feasible, maintenance requiring special skills-such as I/O equipment of computer, power facilities, etc.-should also be subcontracted. To make this subcontracting possible, domestic businesses which can be entrusted with such maintenance work must be fostered.

7.1.4 Facilities Which Are Readily Maintained

(1) Automation of Maintenance

With the telecommunications system becoming highly sophisticated, it is not desirable to do the maintenance work manually, because this does not make optimum use of the maintenance personnel's ability; nor is it economic. Instead, such maintenance should be automated to keep hold it at a high standard, to improve reliability and reduce maintenance personnel. P.T. Indosat should therefore aim to automate the maintenance work where feasible.

(2) Facilities Which Are Readily Maintained

When ease of maintenance is incorporated into the design of the telecommunications facility, it is said that although

initial construction cost may be increased overall cost will be reduced through savings in maintenance costs, thus more than offsetting such an increase. A facility which is readily maintained also has higher reliability. Designs incorporating such approaches as redundant configuration, load diversification, and function diversification will have greater ease of maintenance and reliability. It will be necessary therefore that the facilities to be introduced into P.T. Indosat should be designed with due consideration given to their ease of maintenance.

(3) Equipment Compatibility

Using identical models of equipment for identical functions in the telecommunication facilities to be introduced into P.T. Indosat will enable easier maintenance and interchangeability of spare parts, thus improving the efficiency of the maintenance work.

(4) Unification of Programming Language

Software language for the telecommunications system and requisite conditions for man-machine interface should be consistent. The application of these unified language and interface conditions to the telecommunications system will enable considerable improvement in efficiency in design and maintenance work. Such unification proposals are under study by CCITT. P.T. Indosat should cooperate with CCITT in such research work, and actively promote the unification.

(5) Introduction of Support System

A communication system using computers will require frequent changes of office data and program. A support system must be introduced to simplify the work involved in such changes and to confirm normal functioning after the change. The support system may be used as a training simulator for initial training of apprentice maintenance personnel or for periodical brush up training of experienced personnel. The purpose of this brush up training is to put maintenance

personnel in simulated emergencies and train them to take prompt action for the restoration.

7.1.5 Measures for Emergencies

Preparation should be made to prevent total service interruption even when important telecommunication facilities are incapacitated for a prolonged period due to serious disturbances or disasters.

The provision of multiple gateways, dual terrestrial transmission lines, dispersed submarine cables, multiple satellite earth stations, etc. for the network should be considered as well as the application of a redundant configuration for the facilities. The installation of emergency telecommunication circuits between stations and offices will also be required.

Chains of command, switch-over sequences, and other necessary measures in case of emergency should be established, in readiness. These measures will be prepared under the supervision of the administrative authorities.

Although considerable cost and expenses will be required for implementation of the emergency plan P.T. Indosat should exert its best effort to have such plan in readiness as a responsibility of sole operating agency engaged in international telecommunication services for the country.

7.2 Service Operation

The 1980s will be era when new telecommunications services primarily consisting of highly sophisticated high speed transmissions, developed through rapid advances in technology, will be introduced.

Most of the services to be introduced will be based on a customer-to-customer full automatic exchange system eliminating the need for operator assistance, and the introduction of such new services is certain to bring about changes in the demands for existing services.

ISD use for international telephone service is expected to grow, and worldwide international telex services will be fully automated within the next few years, except for a few countries.

7.2.1 Future Operating Mode - Existing Services

(1) International Telephone Service

The growth rate of international telephone traffic (total number of transmitted calls) has averaged 32.6% annually during 1970 - 1980 (Appendix 3.2.1-1). The expected ratio of ISD to operator handled calls 1984 - 2000 is shown in Table 3.3.2.

1) Improving Operator Efficiency

A large portion of telephone operator works is the preparation of call tickets for exchange work and raising the calling and called parties. Ways to do these jobs more efficiently include the following:

a) Introduction of CLR

CLR is an abbreviation for Combined Line & Recording Operation. After an international telephone operator completes call acceptance procedures, the operator checks the number of the calling party while holding open the circuit from the customer, and then proceeds to call the

foreign party.

The introduction of this system will generate the following advantages:

- i) The time required to establish the connection in the overall work flow can be reduced.
 - ° It is not necessary for the calling party to hang up the phone after requesting for a call.
 - ° It is not necessary for the operator to inform the calling party that she will be called back later.
 - ° It is not necessary for the operator to call back the calling party.
 - ii) Domestic line use time can be reduced.
- b) Installation of Electronic Switchboard
- Although an electronic switchboard must be installed together with an electronic exchange system, its functions will include the following:
- i) Information received from the calling party can be recorded in the memory of the electronic exchange system by operating a keyboard.
 - ii) The call circuit can be established by pressing the "SIGNAL SEND" key for the number of the called party.
The circuit so established can be isolated from the switchboard after confirming commencement of the call.
 - iii) The need for preparation of the call ticket is eliminated as the recording of call data will be done by the electronic exchange system.

- iv) Incoming calls can be automatically distributed to available operators.

2) Number of International Telephone Operators

The number of international telephone operators required for the planned period is estimated as follows for both JAKARTA and MEDAN stations:

	1984	1985	1986	1987	1988	1989	1990	1994	1999	2000
JAKARTA	407	474	438	496	560	627	665	924	1024	1077
MEDAN	101	108	97	104	123	147	157	213	301	315
TOTAL	508	578	535	600	683	774	822	1137	1325	1392

Table 7.2.1 Numbers of Telephone Operators

The basis for calculating this is shown in Appendix 7.2.1-1~5 and Appendix 7.2.1-(1)~(20). The figures are obtained by supposing the average holding time as 300 sec/call and the distribution of the answering time of more than 11 seconds within 15%.

In addition to the required number of international telephone operators as shown in the above table, each telephone office will require general administration staff to complete the staffing requirements of the office.

3) Number of International Telephone Switchboards

The number of international telephone switchboards required for the planned period is estimated as follows for both JAKARTA office and MEDAN office:

	1984	1985	1986	1987	1988	1989	1990	1994	1999	2000
JAKARTA	143	163	151	171	193	217	230	321	356	376
MEDAN	34	35	32	35	40	49	52	72	102	108
TOTAL	177	198	183	206	233	266	282	393	458	484

Table 7.2.2 Numbers of Telephone Switching Positions

The basis for calculating this is shown in Appendix 7.2.1-6 and Appendix 7.2.1-7.

4) Future Operating Mode

As seen in Table 3.3.2 ISD usage rate will reach 85% of total calls by the year 2000. At the same time, operator-handled calls will increase to about 6.8 times those for 1981.

As far as the operation of an international telephone station is concerned, future telephone operator work will not differ much in nature from the present, that is to say, as long as the types of call (such as personal and collect calls) remain, operator assistance will be required. Work such as number inquiries, accepting and handling other inquiries and complaints, service traffic control, and summary of traffic data will also require operator work.

Strong request expected to come from users, under such circumstances, will include immediate response by the operators, a reduction of the time taken between applying for a call to the completion of connection, and immediate reply to inquiries.

To ensure that this work is done properly, a system must be established to constantly monitor the operating conditions by the staff, led by the service traffic controller, to meet the service standards designated by P.T. Indosat. At the same time, studies must be made of the information guide services to analyze the types of information sought by the users. Using the results of such analyses, items which could be handled by an automated system should be automated (computerized) wherever possible.

From a system structuring viewpoint, provision should be made for immediate access to information needed by the user, through availability via designated commands to the system by the operator, without the operator having to move from his seat.

5) Operation of International Telephone Office at Medan Station

It is expected that the telecommunications of eight ASEAN countries to/from Sumatra will be routed through Medan Station when it first opens, and European countries will be included when the Indian Ocean submarine cable comes into operation.

The expected number of calls handled by Medan Station is as shown in Table 3.5.1.

The numbers of telephone operators and switchboards needed at Medan Station are shown in Tables 7.2.1 and 7.2.2. Although the nature of operator handled works will not differ much from that of the present time, the scale of operation (numbers of operators and switchboards) estimated from the expected traffic in the year 2000 will be as large as that of the present Jakarta Station.

(2) International Telex Service

The estimated growth rate of total international telex transmissions was shown in Appendix 3.2.2-1; the average annual growth was 36.2% during the 10 years from 1971. Expected annual growth for the planned period averages 9.8%. Calls handled by operators for September, 1982 averaged about 200 per normal day. However, operator-handled telex transmissions will continue to decline as automation of calls improves in the destination countries.

1) Future of Operator Handled Calls

As of January, 1983, the number of destinations for operator-handled calls transmitted from Indonesia was 35. In view of worldwide trends for fully automatic telex service, most of these 35 destinations may be fully automated during 1982 - 87 (refer to Appendix 7.2.1-8).

Although the automation of operator-handled calls will require an agreement with the telecommunication operating organization of the destination country, the automation at P.T. Indosat will follow trends similar to

those of other countries. In proceeding with the automation of the telex service, destinations for which automation will be relatively easy are those to which semi-automatic transmission from Indonesia can be made already. Among these destinations the one to which fully automatic transmission is being made from other countries will be the easiest for P.T. Indosat to automate the calls.

Consequently, the nature of the work handled by operators will change from the exchange activity of the past to information-provision work as the automation of the telex service progresses.

Information-provision work will primarily consist of the following:

- * Providing telex subscriber numbers inside and outside the country.
- * Investigation of calls which cannot be placed.
- * Handling of troubles during transmission.
- * Complaint handling.
- * Inquires for telex charges, etc.

Among these many of the inquiries about troubles during transmission, complaints, and inquiries for telex charges must be determined from the transmission records, therefore, the records should provide information to make a judgement if the cause of trouble lies with the domestic user, the communication facilities, or the destination country. The exchange system must be able to provide the operator with necessary data promptly in response to the latter inputting a retrieval command for telex traffic records.

The current operating method does not allow the international telex operator to call domestic subscribers. Such operators must hold the incoming inquiry call during investigation and reply, which prevents effective use of the circuits and operator positions.

It is desirable therefore to adopt a method which allows the operator to cut off the circuit when the inquiry is received and call back later to the inquiring

party to inform of the investigation result.

With advanced intelligent terminal equipment becoming available for telecommunication, many terminal devices with CRT and providing partial storage functions are being used. Efficient operation in the information-provision and exchange work can be made by introducing such equipment to the operating position.

2) Telex Operation at Medan Station

The number of total calls and operator handled calls originated from Indonesia are as shown in Appendix 4.8.2-2.

The operator-handled calls at Medan Station will be very small, judging from the number of total operator-handled calls made from Indonesia. If Medan Station is to handle the operator-handled calls, a minimum of 3 positions and 3 channels (2 for exchange and 1 for reserve), and some 10 operators including a supervisor, would be required. This demands an excessive investment be made both in the facility and personnel for very small traffic which is also in a decline trend. The same applies to the inquiry- and information-handling works.

Therefore, telex operation after Medan Station goes into the operation should be limited to routing of the automatic calls only, and the operator-handled calls and inquiry handling should be done at Jakarta Station, as at present.

In this case, charges for the use of domestic circuits can be reduced by routing lines from WITEL I and II subscribers to Jakarta Station, as shown in Appendix 7.2.1-8.

(3) Telegram Service

Worldwide demand for telegram service is declining year by year, and the trends in Indonesia also show the decline - see Paragraph 3.6. It will not be necessary therefore to computerized telegram handling work.

However equipment such as ASR type terminal equipment with TD should be installed for more efficient delivery by

receiving telegrams via printers and tapes of this equipment.

7.2.2 Standards for Operation Control

Standards for operation control may be considered to be quality control standards and service control standards for the manufacture and sale of a product called "International Telecommunications Service".

Indeed, the operating offices in international telecommunications is a manufacturing plant and sales outlet for the product. When a manufacturing plant only tries to manufacture a product of quality far exceeding the standards necessary, the cost of such product will be too high. When the quality of such product falls below the standards, it is a poor quality product and big demand cannot be expected.

The sales outlet must try to offer good service to the customers without keeping them waiting for prolonged periods even when the product satisfies the quality standards. These are the reasons why the standards for operation control must be established for the quality control of customer services.

(1) Items to be Established in the Standards for Operation Control

Major items to be established in the standards for operation control for international telephone, telex and telegram services are as follows:

1) Telephone

- * Response Time - Time required from incoming of call to response of operator.
- * Time Required for Establishment of Call (by type of call)
- * Waiting Time by Destination
- * Connecting rate by Circuit and by Destination (by the time of day)
- * Error/Accident Occurrence Rate (erroneous connection, interruption during transmission, etc.)

2) Telex

As for Telephone

3) Telegram

- * Error Rate (address, text)
- * Erroneous Transmission and Erroneous Delivery Rates
- * Non-Delivery Rate (or non-contact)

Each country has a different approach to determine criteria for operation control. In Japan, for example, the quality control standard time for telephone response is 11 seconds, with the distribution of responses exceeding 11 seconds within 15%.

P.T. Indosat should establish its own control criteria after calculating the average time required for each job, and making adjustment between the values so calculated and the opinions of customers collected through questionnaires, etc.

(2) Telephone Operation Traffic Control

The purpose of this traffic control is to take appropriate action as determined through constant observation of communication conditions such as the amount of traffic, and changes in response and handling work loads, every hour and minute, to satisfy the control criteria.

It is an especially important responsibility of traffic control to place a limit on incoming calls or to assign additional personnel in rush periods.

Therefore, personnel in charge of traffic control must therefore be selected from those who have sufficient experience in the operation and fully familiar with the operation control criteria.

Part of this traffic control should be automated through computerization.

(3) Recording and Summarizing Operation Control Data

Data to be recorded with regard to operation consist of both automatically and manually recorded data.

Automatically recorded data includes the total daily traffic count, the traffic by destination, by hour, by minute, by type of handling, etc. and should be in as much detail as possible.

Manually recorded data are those which cannot be recorded automatically and include the operation diary, etc.

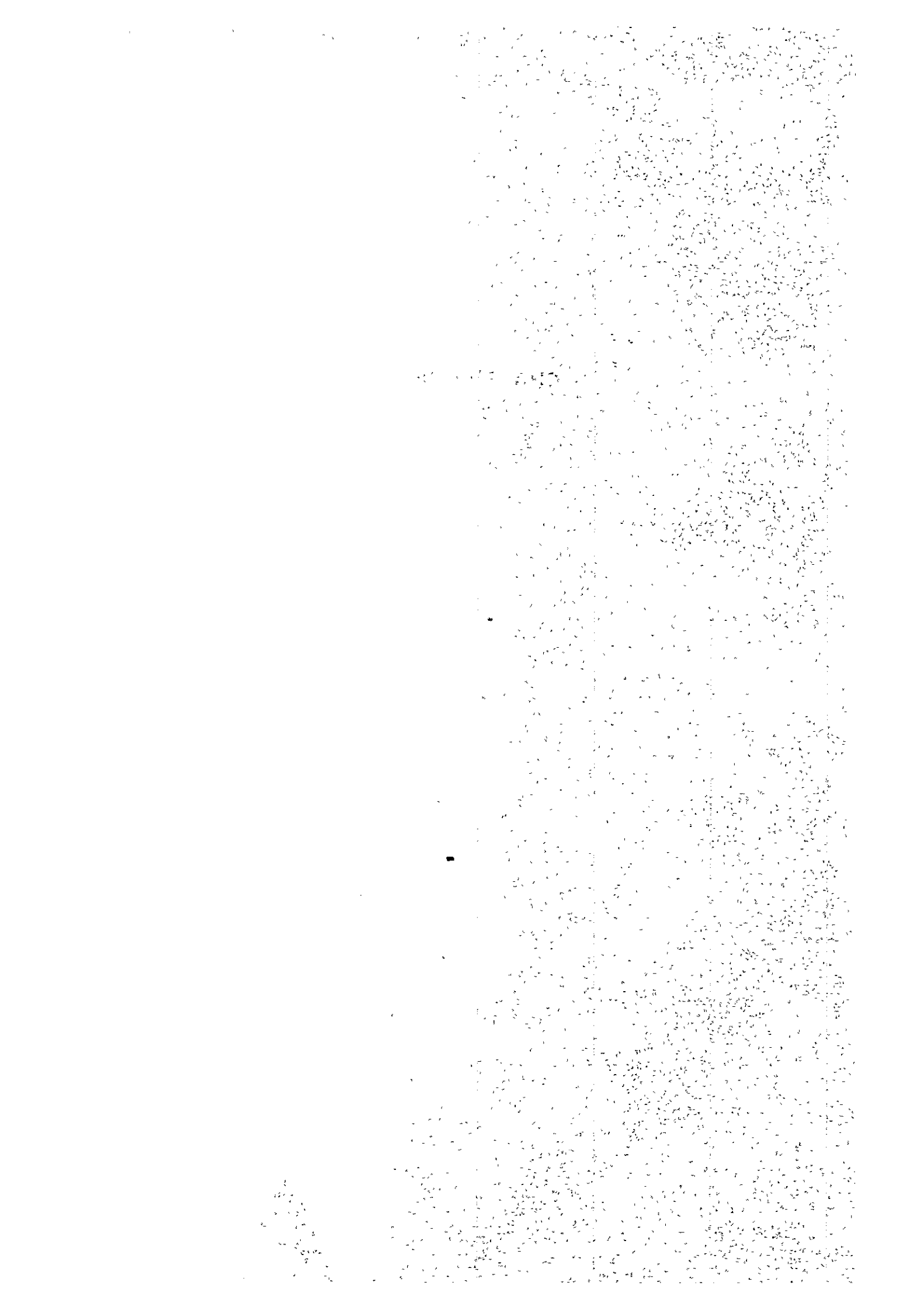
When examining the time elapsed for handling jobs, from receiving the incoming call to the completion of connection, clarify the duration flow of each service for the study of operation sequences, the recording of such time must rely on manual recording.

These recorded data are summarized by the operating offices of each service and reported to the related departments. Data thus obtained will be used for the facility, personnel, sales, publicity activity and other plans to be prepared by respective departments.

It should be noted that the draft report prepared by the operating offices for related departments are the most basic data for establishing management strategy, and should be sent to the document control section for safekeeping.

CHAPTER III

8



8. Marketing

One of the objectives in the third 5 year development plan for Indonesia is "Realization of Economic Growth". Although telecommunications is only a means to promote active economic activities, it plays an essential role in them.

P.T. Indosat must support the growth of the national economy through providing a telecommunications service which is to be a foundation for such economic activities and, at the same time, become in itself a base for Asian telecommunications. P.T. Indosat therefore must engage in strategic marketing activities, not from the standpoint of an sole operating agency of international telecommunications within Indonesia, but as an internationally competitive business.

To conduct strategic marketing activities, i.e., marketing activities as a management strategy, the systematic and methodical adoption of items such as those described below is desirable.

1) Collection and Analysis of Information

Economic information, both of Indonesia and overseas, and the needs of international telecommunication services users, etc. as well as the information related to the telecommunication, should be collected and analyzed.

2) Promotion of Sales Activities

Sales activities should focus on the specific, aggressive sale of services to customers, by visiting them - not just waiting for counter sales.

3) Aggressive Public Relations Activities, and, in a addition

4) The establishment of an active sales organization is necessary to conduct such strategic activities as those described above.

8.1 Collection and Analysis of Information

P.T. Indosat must always strive to improve the quality of existing services and to develop and introduce new services in order to offer better service to users while exclusively offering international telecommunication services.

The opinions of users about specific aspects of the service provide important guidelines for improvements. It is also necessary to tune into the developing needs of users, to aid the evolution of new services.

On the other hand, the economic environment surrounding the business delicately affects the services or commodities. Demands on existing or new services may vary depending on changes in the Indonesian or international economies.

The introduction of a new service also affects existing services.

Therefore, the collection and analysis of the information on such changes in the economy and on service improvement and development will enable the creation of a marketing strategy which can face all variations and extremities.

8.1.1 Market Survey

Market surveys should be conducted to contribute to the improvement and development of the telecommunication services. User dissatisfactions can be reduced and the business image of P.T. Indosat enhanced by offering services which reflect the survey results.

Two basic methods of market surveying are:

- 1) surveys on the trends in demand
- 2) surveys on customer needs.

(1) Survey on Trends in Demand

This is mainly to study and analyze demand for existing services.

The items to be surveyed include:

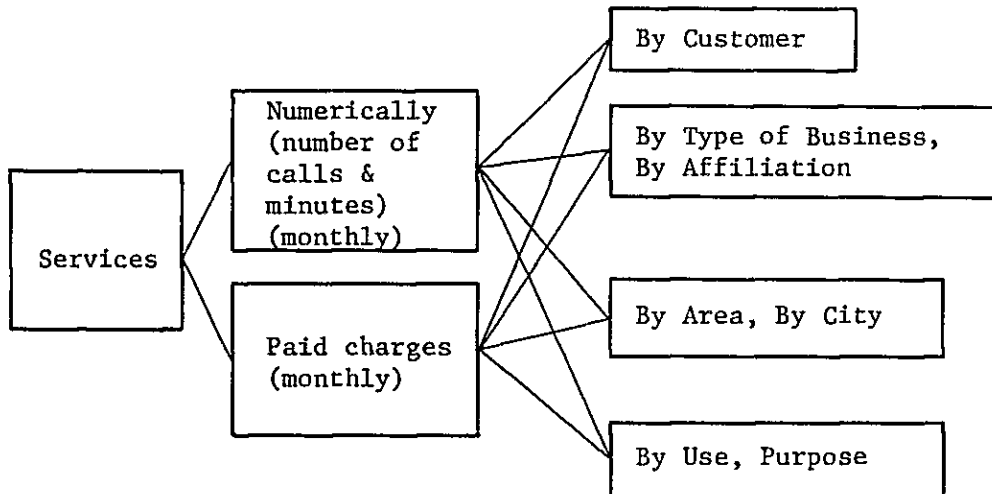


Fig. 8.1.1 Items to be Considered in Survey of Trends in Demand

Trends in demand for each service can be disclosed by analysis of the survey items as shown above. In addition, prospective customers which have not been the subject of this survey may be indexed out by the respective item. The demands can be promoted directly by having sales personnel visit such prospective customers, or indirectly by calling or sending promotional material.

(2) Survey on Customers' Needs

This provides highly useful guidelines for the improvement of existing services and for the development and introduction of new services.

The method should include:

- (a) Survey by visiting customers.
- (b) Survey by questionnaires sent to customers.
- (c) Survey through periodical meetings with major customers.
- (d) Monitor System
- (e) Customer Comments ... Requests and complaints received from customers through the head office or operating offices.

Customer needs according to the respective classification can be spotlighted by selecting from the subject of items of the survey described in the preceding paragraph (1) or from their related customers.

Caution must be taken on the following points in conducting these surveys:

- (a) There will be stronger emphasis on the customers' dissatisfactions and on requests relating to existing services.
- (b) Complaints received directly by telephone or telex operators (Customer Comments - (e) above) might not have been reported.
- (c) Requests for new services could well go beyond services contemplated as future plans.

Survey personnel on the receiving and of customer comments must report all of them to their superiors; they must NOT make selections at their own discretion. By 'survey personnel' as used here are included not only the people in the marketing group but ALL the company staff, from managing director to operators. For example, requests or complaints received by telephone operators must reach the marketing group - in these cases through reports via their supervisor.

The marketing group will classify collected information in such categories as Urgent, Execute, Study, Future Reference, etc., thus building a file of references for future steps toward the improvement and development of the services.

8.1.2 Collection and Analysis of Information Regarding Telecommunications Overseas

To aid the advancement of international telecommunications in Indonesia, information about overseas developments in international telecommunications should be obtained promptly and quickly reflected in the existing or planned services, where relevant.

Information about international telecommunications will consist of:

- (a) Outlines of the international telecommunication operating organization in each country.
- (b) Services and its tariff, and traffic data by these international telecommunications operating organizations.
- (c) Movements in new technologies and services.
- (d) Trends at the various meetings of international organizations such as ITU.
- (e) Books, publications and newspapers distributed by telecommunication organizations or other organizations related to telecommunications.
- (f) Information obtained through conversations with other representatives at international meetings.

Among the above, information on trends in the development of new technologies (including not only those related to telecommunications but also those in a wider perspective - such as computers, office equipment and electronic components) and new services indicated in the item (c) in particular must be collected closely and in detail as they may have considerable influence on future telecommunication services.

By providing the information of carriers in item (b) above (including the nature of added services) to operators group, it is possible for them to make decisions and establish guidelines based on proper awareness of overseas situations, and to give customers adequate information on services they require.

8.2 Marketing Activities

8.2.1 Sales Activities for Telecommunications Services

The sales activities for telecommunication services can be classified into sales activities on an annual basis and those of shorter term (about 1 - 3 months).

Sales activities on an annual basis are those conducted to achieve an annual sales target set yearly; those shorter term ones are for a specific service during certain period or in a specific area, launching a sales and use promotional campaign.

Such specific marketing activities may include:

(1) Use Promotion

Recommend and provide suggestions for use of;

- ° further use of services to those who already have some experience of them.
- ° ISD by explaining its advantages to those who have not yet used it.
- ° Telecommunication services to overseas travellers to/from foreign countries.

(2) Sales Promotion

- ° Disclose prospective customers who have not used the services and promote their use.
- ° Promote the use of the services to those areas which use them less frequently, in time with the plan for the up-dating and expanding of the domestic networks.
- ° Promote the use of leased circuits for users whose use justifies its installation.

(3) Customer Consulting Activities

- ° Provide information on how to use the existing services, how to subscribe, how to use leased circuits, etc. through visits to customers.

- ° Provide information to new users (subscribers) on the effective use of international telecommunications. Hold classes, such as lectures or meetings.
- ° Explain customer questions and inquiries on telecommunications in general.

(4) New Services

- ° Provide information on the conditions and advantages of new services well in advance of their introduction, along with recommendations for their use.

Sales activities cover a wide range as above, but the results of various surveys described in the previous paragraph 8.1.1-(1) can be utilized as useful information for selecting priorities and focal points.

Needless to say, these activities are to be carried out by the marketing personnel. However, forming a project team consisting of the marketing staff and operating personnel, in order to undertake aggressive activities depending upon the purpose and method of the sales activity, should be also considered.

In such a case, the activities may be carried out by having members of the project team visit individual customers or by recommending and suggesting use through demonstrations at customer gatherings.

8.2.2 Customer Relation Activities

The purpose here is to maintain good relationship between P.T. Indosat and its customers. In addition, they should aim to deepen customer perceptions of international telecommunication services.

Data from customers, obtained from survey analysis as listed in paragraph 8.1.1 - (1) is an important pointer for the content of customer relation activities.

The following activities may be launched based on such information:

1) Activities for Customer Groups

For groups of same-type users or businesses.

2) Activities for Special Customers

For large volume users, governmental agencies, and news agencies.

3) Announcements and Usage Guides

These provide information on changes in international telecommunication services tariffs or operating methods.

4) Complaint Handling

Handling and analyzing complaints made to the company and reflecting them in future decisions.

8.2.3 Establishment of P.T. Indosat Sales Branch Office

(1) Economic growth, and commercialization and industrialization of local cities, with transmigration and the development of sightseeing, etc. are moving ahead rapidly in the Republic of Indonesia. Consequently, the country's cities have an ever-increasing need for international telecommunication services.

International telecommunications for these cities must of course depend on PERUMTEL's domestic telecommunication network and equipment (including booth), and the systems in hotels, etc.

Indonesians utilizing an international telecommunication service are unlikely to have any problems providing they have some understanding of the service. Foreigners, however, may well run into difficulties, particularly when placing a call. This could earn an unwarranted unfortunate reputation for P.T. Indosat.

One of the solution is to establish an international telecommunication sales branch office. This becomes responsible for part of the sales strategy, practices the above-mentioned activities in a small scale, and - an essential element of its business - provides booths where visitors can have access to fully serviced international telephone, telex, telegram,

facsimile, etc.

P.T. Indosat is at present restricted in its locations for sales branch offices to gateway cities. For the future, however, it is perhaps unreasonable to expect PERUMTEL to cope with the breadth of matters related to the sales of international telecommunication services when they are already arranging and fulfilling domestic telecommunication network needs. Domestic common carriers cannot readily explain the peculiarities of international telecommunication, particularly in an aspect of PR activity and when the new service is introduced into regional cities.

(2) There are at present four booths (included one for telephone only) for international telephone and telex in Jakarta. All telephone and telex from booths is connected through international exchange offices.

Efficient operation of international telephone booths, however, becomes possible by using international subscriber dialing (ISD) terminal equipment. Overseas calls to direct service areas also enable the telex booth terminal equipment to connect automatically.

The situation is similar for international telephone calls made from major hotels. Hotel guests can make international telephone calls without assistance from hotel operators or the international telephone operators because they can use ISD from their rooms. ISD does require, however, connection to an electronic exchange in a hotel, resulting in higher costs and the imposition of an additional hotel, service charge on the user. Agreement over this should be reached with the hotel, to avoid disagreement arising after ISD calls between users and hotels or P.T. Indosat.

8.3 Publicity

8.3.1 Publicity Policy

The main purpose of publicity is to direct customers' attitudes and behavioral patterns to the service, in a way advantageous to the publicizer. ⁽¹⁾ In addition, publicity activities must make the consumers and the employees aware of the existence and the role of the business, and present and develop an appropriate image.

International telecommunications organizations in Europe and America describe their publicity intentions as follows: ⁽²⁾

PTT (France)

(1) To obtain the full understanding of the populace on the importance of PTT within the national economy, to justify the enormous capital investment in the telecommunications operation.

(2) To explain the reasons why PTT cannot meet certain demands.

(For instance, there must be a clear understanding of why PTT cannot issue detailed statements of telephone charges, despite strong demands for this service; privacy protection, facility limitations, etc.)

(3) To obtain cooperation with the needs of PTT. The writing of the postal code, for example, cannot function even when the system is established without the cooperation of the customer.

Notes (1) "Marketing in a Competitive Economy":
Hutchinson & Co., 1965 by L.R. Royer.

(2) "Change in the Business Environment and
Publicity Activities": General Research
Institute of Telecommunications, March, 1982.

AT & T (U.S.A.)

- (1) To deepen the employees' interest in the problems improvement of the service.
- (2) To obtain the understanding of society and employees that high revenue is necessary for the maintenance of high quality service and that increased revenue through efficient business management helps suppress price rises.
- (3) To publicize internally and externally that the company is progressive in both technology and management for new service development, in efforts to satisfy customer needs, improvement of productivity, etc.
- (4) To publicize the existence of products and services which meet the telecommunication needs of customers by telling of success stories about how the development of new products and services by AT & T helped customers' businesses.
- (5) To promote through advertising, in cooperation with the marketing group, those products and services which may become more profitable through such promotion.
- (6) To extend cooperation to the accomplishment of the marketing and sales functions.
- (7) To emphasize the social (public) advantages attained by the integration of Bell System and the desirability of centralized control for a public network.
- (8) To publicize internally and externally the role played by this department (Long Lines Public Relations & Public Affairs Department).
- (9) To show clearly the relationship between the local society and AT & T, and publicize the relationship between the local society or consumers and the Department through local society activities.

- (10) To obtain employee understanding of the direction toward which the Department should proceed in future.
- (11) To improve telecommunication between management and employees.
- (12) To show clearly the company's strong interest in the improvement of employee welfare.
- (13) To improve the skill of publicity personeel in specialized or managerial areas.

P.T. Indosat must also make a big effort to effectively publicize its existence and promote the use of its services, not to monopolize business, but to ensure profitable operation as a business.

8.3.2 Forms of Publicity

In view of the specialized nature of international telecommunications in Indonesia, it is assumed that the name P.T. Indosat may not be well known outside specific business circles.

Also, there may be some people among general users who are assuming that international telecommunication is part of PERUMTEL's activities.

Therefore, P.T. Indosat must undertake publicity activities somewhat differently from usual.

Forms of publicity desirable for P.T. Indosat to conduct are:

- (1) Press Interviews - held regularly or from time to time

These should be held to enable media reports on P.T. Indosat. These should aim to build a correct understanding of P.T. Indosat's services, and of the nature of international telecommunications.

- (2) Mass Communications Media

These include the broadcasting systems, newspapers,

magazines, posters, and directories such as telephone directories.

Broadcasting is included because it is helpful to have consumers not only realize the existence of P.T. Indosat's service but also to be aware that it is the medium through which much of the international news for other media - newspapers, etc. - is received, and also that international television transmissions are similarly received, even though P.T. Indosat's name would not appear in the broadcasting program itself.

(3) Issuing of Publications

Publicity through mass media aims to establish a general image of the company within a limited time or space.

Publicity through publications explains the services in more direct and specific manner, so that consumers can refer to them for easily understandable information.

The following publications should be issued:

- 1) Pamphlets about each service - for general users.
- 2) " " - for visitors.
- 3) Company periodicals for internal or external purposes. One of these should be a corporate profile.
- 4) Guidelines recommending and suggesting the use of the services, for direct mailing.
- 5) Bulletins sent by direct mail, advising of changes in existing services or explaining new services, etc.

(4) Campaigns

Campaigns for the promotion of a specific service should use all relevant media.

(5) Special Events

P.T. Indosat should take an active part in expositions or new technology shows, both domestically and internationally.

Demonstrations of the communication services should be given at such times.

(6) Production of Publicity Films

Films should be produced which illustrate the nature P.T. Indosat's activities, the history of international communication, future prospects of communication (including science fiction prospects), the technology of communications, etc.

(7) Cooperation with Opinion Leaders

Widely propagate the advantages of international communications to and through the leaders of every field, such as politics, economics, culture, education, etc.

Hold round table discussions and prepare articles reporting such discussions, and essays written by such leaders.

(8) Appealing to Youth through Visits to Schools

Middleschool (Junior high school) and high school students are future prospective consumers or the company staff.

Establish among them a good image of the company and of its business involving leading technologies, by using the publicity films or demonstrations given at during visits.

(9) Setting up of an Overall Information Center for Telecommunications

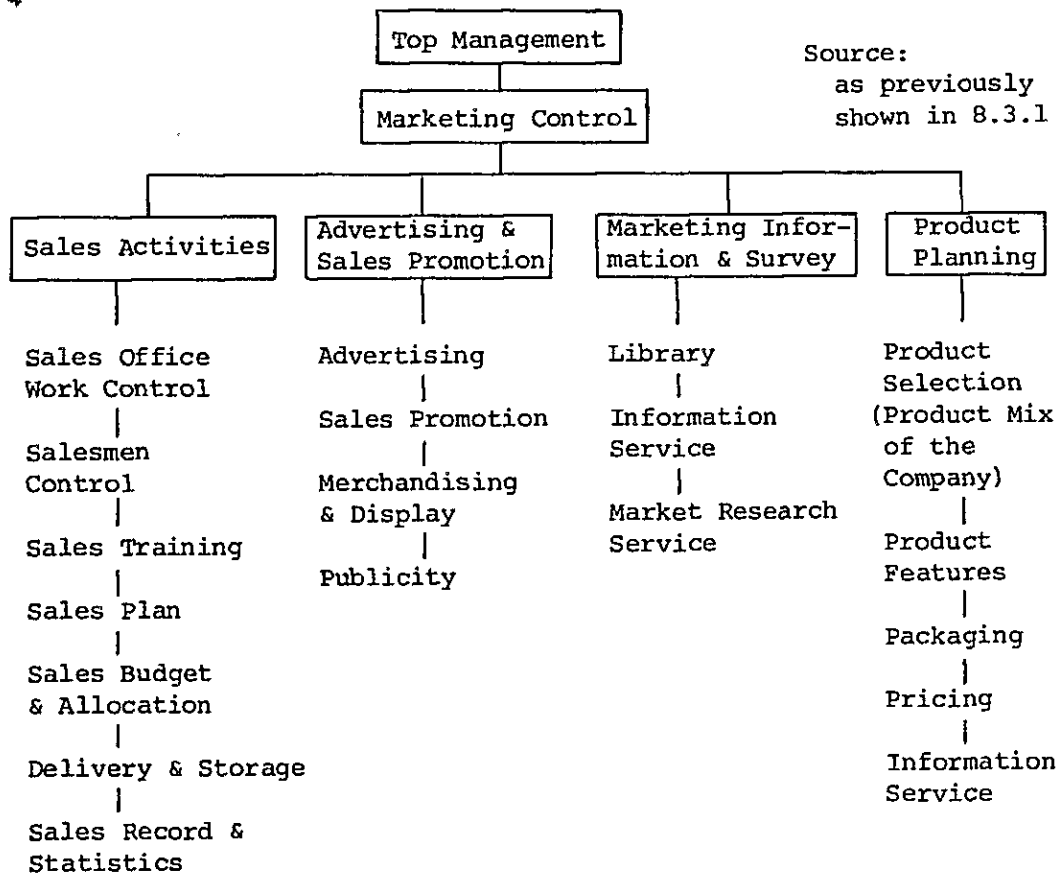
Set up an information center with demonstration terminals and miniature sets so consumers can understand the existence and basis of operation of services.

8.4 Establishing An Organization for Strategic Marketing Activities

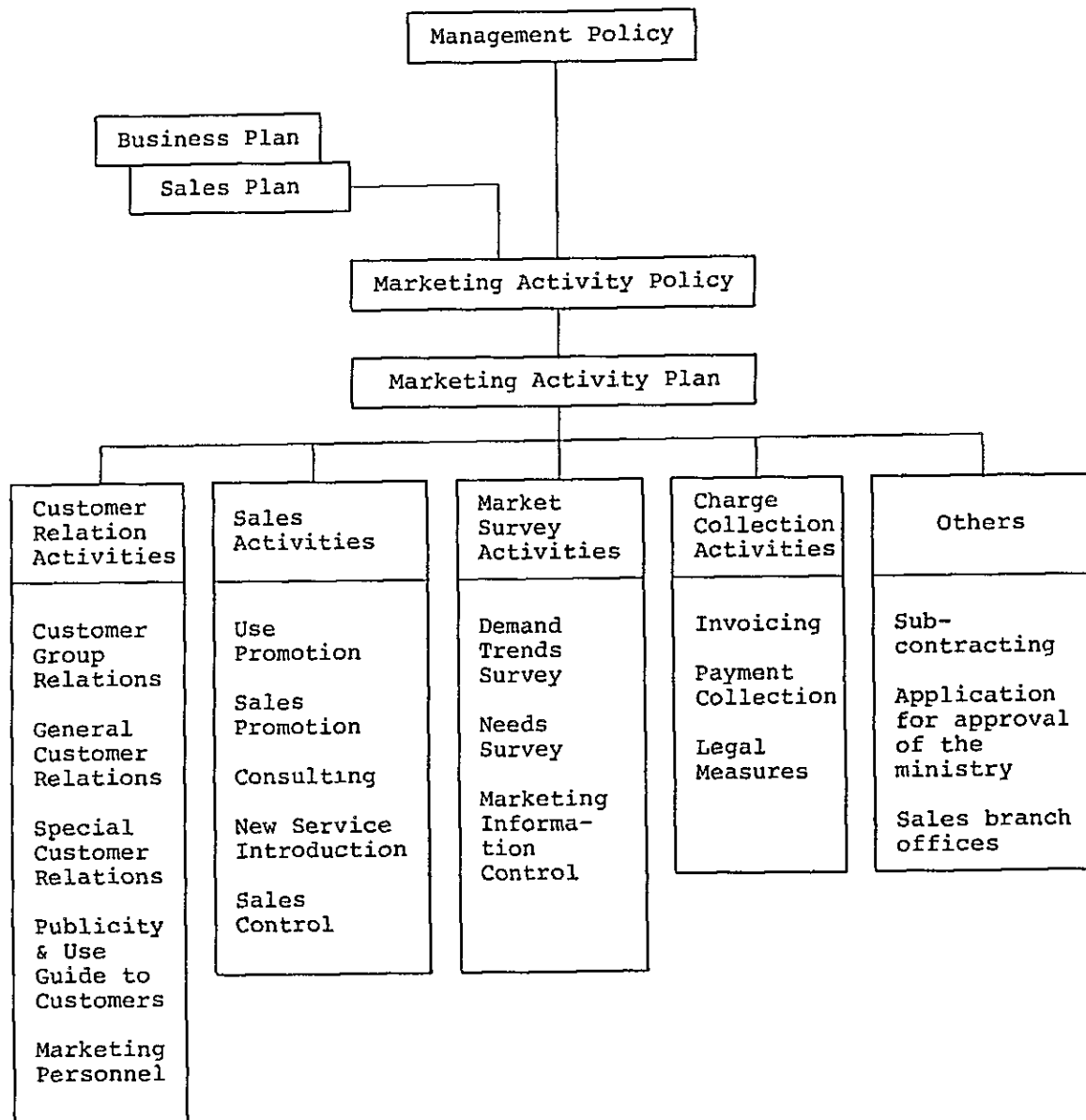
8.4.1 Marketing Organization

To promote the strategic marketing activities described in this chapter each department must be organized, with an effective overall coordination plan, to engage in the aggressive activities in each specific area.

Marketing activities are systematized as follows:



An example of systematizing the marketing activities relating to international communications might be as shown below:



Although the two systems are described differently, their contents are similar and each of them includes the same essential elements.

The system should function by preparing business and sales plans based on the management policy of P.T. Indosat. Departmental policies and activities should be determined in each department of the marketing group during the planning stages of the business plan and the sales plan. The policies and

plans so determined should be made known to the staff and line personnel of each department to assure the achievement each objective.

The organization should be constructed to cover the basic matters described in 6.2.2.

8.4.2 Information Processing System

Comments have already been made in the respective paragraphs of each of the preceding chapters about the automation of some of the work - i.e. the introduction of computers.

The computers will become essential for P.T. Indosat if it is to prepare itself for the new age of electronics in the remaining few years of this century.

The volume of office work is expected to become enormous as P.T. Indosat grows, and technologies are expected to grow further.

The increase of the office work means an increase in the amount of information and data to be analyzed. Further, it means increased levels of time, materials and human intelligence.

In such a situation, computers will substantially reduce the amount of time and material for the work, freeing people to attend to more demanding activities. On the other hand, some of the investment in computers is wasted if the systems are not compatible - i.e. the data produced by one must be usable in the others.

To prevent such waste and also to prepare systematic processing plans, an additional department might be needed. This department would study the introduction of information - processing computers as described above, data control, and data sorting, storing and microfilming techniques involved in handling the various information materials and internal documents.

Information processing computers can be used for:

1) Preparation of Original Data

- Summary of traffic data for various services
- Invoicing references

- Traffic control
 - Retrieval of information required for operation
- 2) Charge/Collection
 - Invoices
 - Mailing
 - Debtor summaries
 - 3) Statistics and Analyses
 - Calculations based on the traffic data
 - Control of various external quantitative data
 - Control of customer data
 - 4) Office Work Processing
 - Accounting work
 - Personnel administration
 - Training
 - Quantitative processing by each department
 - Information retrieval
 - Transmission of internal communicating data

Data entered in these computers will be used according to the work flow illustrated in Fig. 8.4.2.

The original data entry, charge/collection and statistics and analyses systems would require large computers while the training system may operate satisfactorily with a smaller one, depending on the extent of simulation functions required. For other types of work the microcomputers which are becoming popular recently for office automation would be able to cover the processing to certain extent.

8.4.3 Billing and Collection of International Telecommunication Charges

As long as P.T. Indosat intends to promote strategic marketing policies it must ensure the charges related to its business are collected. For that purpose the collection of international telecommunication charges must be constantly

checked, as through the introduction of computers as described in 8.4.2.

The charges are collected in the following steps after the introduction of computers:

- The computers output the invoices for international communications for the preceding month.
- Invoices are mailed.
- Upon their receipt of the bills the users will pay the charges to the business offices of P.T. Indosat or PERUMTEL or make a cash transfer of the charges from the nearest bank or post office to the account of P.T. Indosat.
- P.T. Indosat will check the collection information based on the receipt information and will take suitable measures to those who have not paid the charges as may be necessary.

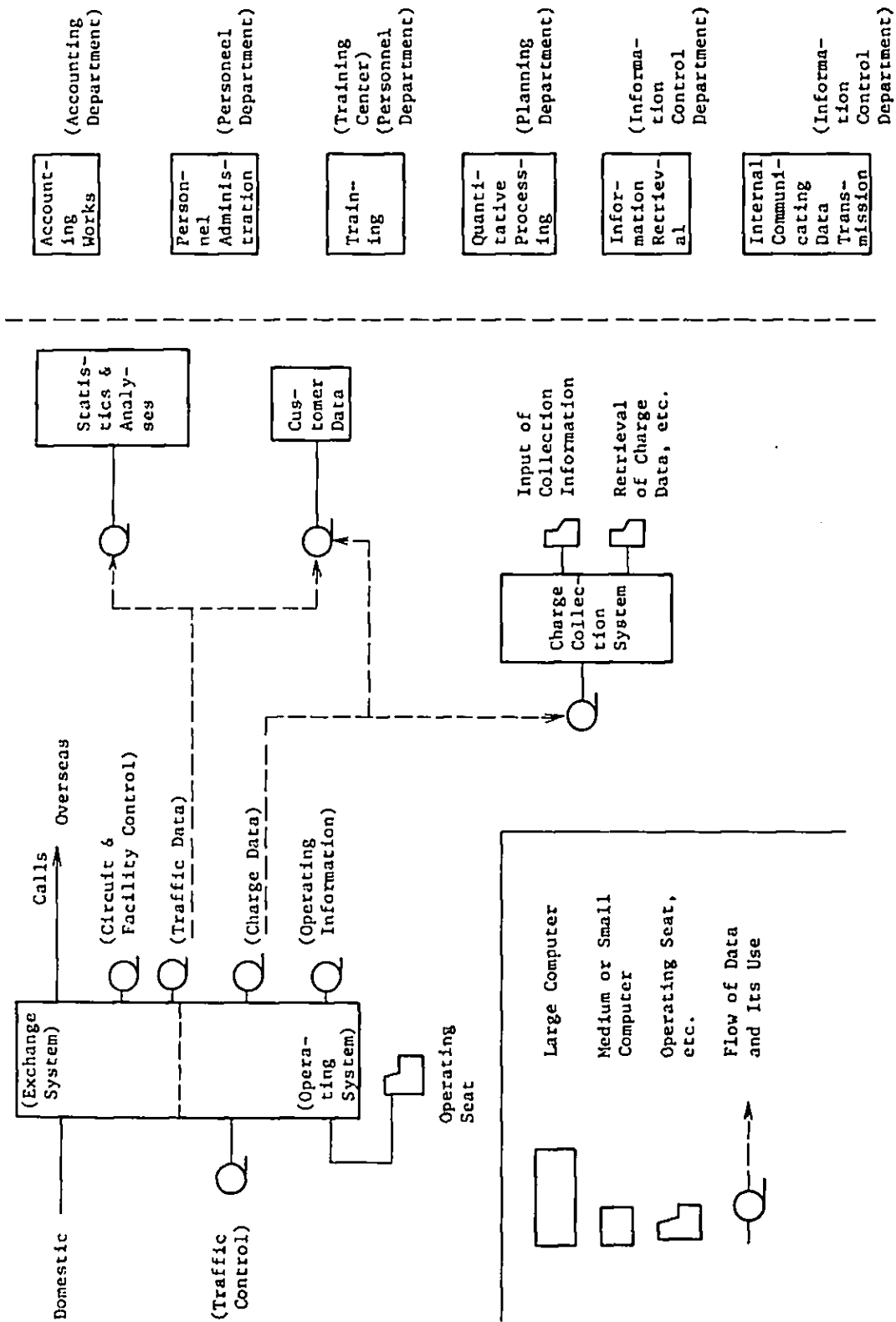


Figure 8.4.2

CHAPTER III

9



9. Cooperation with PERUMTEL

9.1 Basic Considerations

The relationship between P.T. Indosat and PERUMTEL is determined by the general provision of "Government Regulations of the Republic of Indonesia; No. 53 of 1980" as follows:

Close cooperation is required to insure;

- (a) to ensure the smooth-running of the organization of public telecommunications whether domestically or internationally.
- (b) to ensure the constant availability of public telecommunications facilities whether domestically or internationally which are good and reliable.

International telecommunications cannot eventuate without domestic public telecommunication equipment; without the latter, the establishment of independent domestic telecommunication equipment for overseas telecommunication results in wasteful dual investment.

Each organization has its own area of operation, but to offer a co-ordinated public telecommunication service the two must work co-operatively. Among the many considerations to be observed, P.T. Indosat and PERUMTEL should understand the business and service of their partner, to enhance the ability of each to work with the other for development of public telecommunication in Indonesia.

9.2 Maintaining PERUMTEL Cooperation

To retain cooperation between P.T. Indosat and PERUMTEL, the following are required:

- (1) conclusion of a fundamental agreement,
- (2) systematization of the two organizations, and
- (3) exchange of information.

9.2.1 Concluding a Fundamental Agreement

P.T. Indosat started as a stock corporation Jan. 1981 to supply international telecommunication services, then concluded an agreement with PERUMTEL. The agreement, however, is written on a provisional basis so that P.T. Indosat may start as an independent corporation.

This agreement would require fundamental revision if it were to provide for P.T. Indosat possessing its own international public telecommunication equipment and buildings, etc., or provide autonomous operation. In the point of different view, even concluding the new fundamental agreement will result in that P.T. Indosat is completely separate organization from PERUMTEL.

The maintenance of good cooperation between P.T. Indosat and PERUMTEL, would require that the agreement contain the following:

- (1) purpose for the new agreement
- (2) installation and utilization of public telecommunication equipment
- (3) business trust
- (4) charges
- (5) discussion between two parties

9.2.2 Systematization of Organization

P.T. Indosat executives responsible for coordination or discussion with PERUMTEL should be grouped together to form one contact point, thus ensuring not only best cooperation but also operational activity. This will minimize the spread of opinions from other departments to PERUMTEL, and help unify P.T. Indosat's policy. This 'one information window' will greatly ease communication between the partners, and provide PERUMTEL with a specific group in P.T. Indosat for discussion.

For the contact point group to always transmit an unified opinion, it must coordinate the opinions of all relevant departments in the corporation. On the other hand, it is also responsible for sifting out significant opinions, and formulating

an overall viewpoint and policy.

Further, although P.T. Indosat's marketing department can be the communicating point with PERUMTEL, its staff cannot handle the specifics of all matters under discussion. It must therefore draw on staff from other departments concerned to explain and clarify details.

9.2.3 Conference between Both Parties

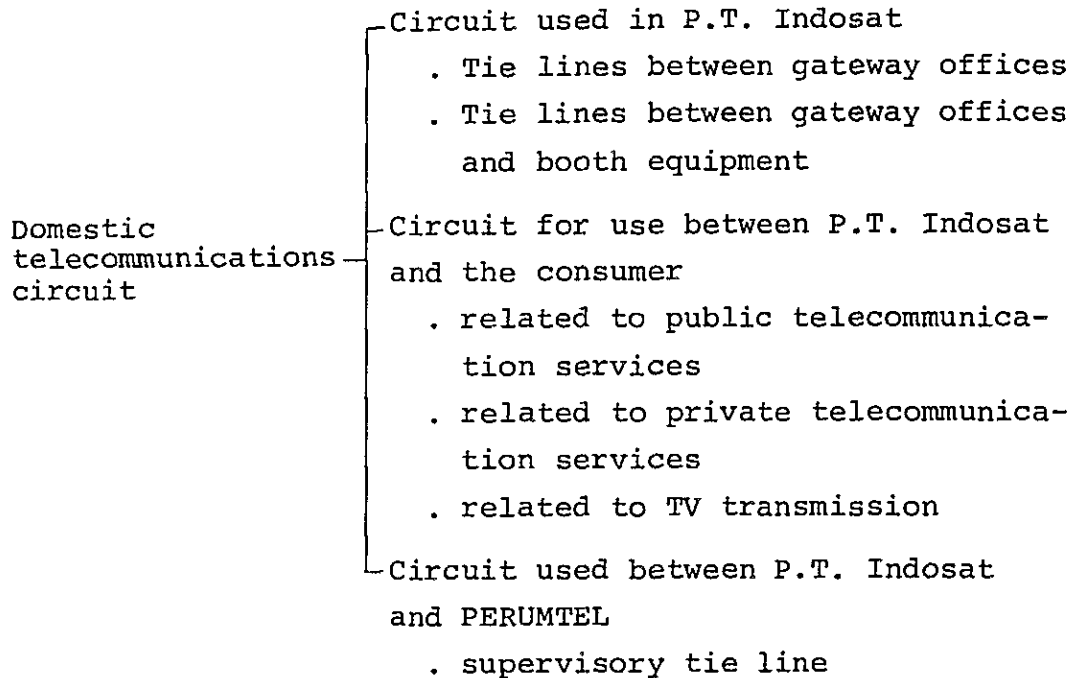
As P.T. Indosat's promotion activities boost demands on existing services, and with introduce new services based on new technologies, an effective relationship with PERUMTEL and the interface with the domestic telecommunication equipment becomes essential.

Difficulties may not arise if P.T. Indosat reserves its activities to a limited geographical area, such as Jakarta and Medan. It is essential that P.T. Indosat obtain information on PERUMTEL's domestic telecommunication equipment in order to project long-term and strategic sales and equipment investment plans; it is also necessary that P.T. Indosat discuss its plans with PERUMTEL so the latter can ensure that its facilities can cope or can be upgraded to suit.

Consequently, both P.T. Indosat and PERUMTEL should strive for mutual understanding, holding regular conferences and integrating international and domestic telecommunications to create a coordinated national public telecommunications service.

9.3 Telecommunication Facility

The domestic telecommunication facilities for international telecommunication may be classified thus:



Utilization of domestic telecommunications circuit will significantly avoid duplicated investment. It is also reasonable to depend upon PERUMTEL's network, maintenance and organization, throughout the country, on a long-term basis.

In addition to circuits above, there are operational aspects which make it preferable that P.T. Indosat to build and operate its own tie line between the earth station/cable landing station and the gateway office.

The circuit from such stations to the gateway office is regarded as an international circuit, part of the international telecommunications link, and it is fundamentally desirable for P.T. Indosat to build and operate it.

However, if the distance between the international and gateway offices would cause engineers to waste much time travelling to attend to equipment breakdown, then it would be preferable to lease PERUMTEL equipment.

9.4 Business Trust

8.2.3 emphasized the necessity of P.T. Indosat's sales branch offices to be under direct management for effectively unified strategic sales activity. However, it is practically impossible to set up direct-managed offices of P.T. Indosat in

all areas to cover the whole country. Fulfilling the demand for international telecommunication from all the areas could result in duplicated investment in equipment.

The two organizations therefore need to have an agreement as a basis for business trust. The billing and collection of international telecommunication charges will need to be on a similar basis; PERUMTEL's organization will thus need to be able to accommodate such aspects of international telecommunication service.

9.4.1 Business Trust to PERUMTEL

The following will be needed for P.T. Indosat to entrust business to PERUMTEL:

- (1) receiving subscriptions to international telecommunication service
- (2) servicing international telephone and telex booths
- (3) sending, receiving, and delivering international telegram
- (4) information service relating to international telecommunications service, i.e. providing is general information about international telecommunication services, such as utilization, promotion, etc.
- (5) management of associated accounting needs - especially billing and collection of accounts for international telecommunications usage.

P.T. Indosat should therefore give a course covering the details of business trust and international telecommunication services for PERUMTEL staff.

9.4.2 Management of Receipts and Nonpayment of International Telecommunication Charges

P.T. Indosat should entrust PERUMTEL with the billings and collection activities as mentioned in 8.4.3 even after it has introduced its own charge and receipt system, because the

widespread payment facilities already available through PERUMTEL will be of considerable convenience to P.T. Indosat customers.

It will be necessary to take firm steps over nonpayment of charges, in the same way as the present system, but these should be agreed to by both parties.

9.4.3 Business Trust Charges

P.T. Indosat should reimburse PERUMTEL for expenses incurred for business trust activities described in 9.4.1 and 9.4.2.

The business trust charges should be calculated from the relevant costs of PERUMTEL's equipment, personnel, services, etc.

CHAPTER III

10.

10. International Cooperation

The international telecommunications management organization of a nation cannot operate an international telecommunications service independently - it becomes possible only by the common consent and cooperation of the international telecommunications management organizations of reciprocal and relay countries.

Cooperation only among countries directly involved with links to each other risks lack of unification of methods of communication and technological aspects on a totally internationally basis. ITU, INTELSAT, etc. aim specifically at establishing standards on such a worldwide level, and to make it possible to supply various services under the same condition.

10.1 Cooperation with International Telecommunication Management Organizations

Two countries (or three countries including a relay country) which have a reciprocal international telecommunications service should strive to supply good quality service to users in the other countries, and to work toward improving that standard. This also requires effective discussion and cooperation with the other countries, particularly when a new service is being introduced or the supply and technical conditions of existing services are being modified.

When such modifications are to be executed, plans should take into account the communications policy and technical conditions of the countries concerned. When the plan is about to be carried out there should be specific discussion to amicably solve any questions and establish more satisfactory strategies.

Some subjects may require meetings between the persons in charge of the plan, or occasionally between top managements. Such situations would require that relevant personnel in P.T. Indosat, particularly those dealing with foreign communications management organizations, can have as close contact as possible.

P.T. Indosat therefore must have close relations with foreign common carriers by exchanging memoranda of technical cooperation with them, and require its personnel to travel overseas for familiarization tours.

10.2 Relationships with International Organizations

ITU (International Telecommunications Union) is the international institution dealing with problems of telecommunications at a worldwide level. ITU investigates problems occurring in every nation, new technologies and services, arriving at recommendations for standards to be adopted by every country.

In other words, ITU can be regarded as having an understanding of problems in every country, and new trends in technology and services.

The international institutions for telecommunications are INTELSAT (International Telecommunication Satellite Consortium) and INMARSAT (International Maritime Satellite Organization) other than ITU.

P.T. Indosat, in aiming at the center of Asia's International telecommunications should join these institutions, attend their meetings as far as possible, collect all relevant information, and establish a research and development support system as early as possible. It should of course obtain reports and materials relating to telecommunications issued from these institutions, as mentioned in 8.1.2.

Although the above-mentioned three are world-wide international organizations for telecommunications, a large number of others also exist.

The majority of these are shown in Appendix 10.2.1. These additional organizations generally fall into two categories - government and common carriers, consisting of groups using communication, and those established by nations in an area.

Some exist with a modest level of formal organization, but many are producing new achievements in research which are making effective contributions to the communications field.

P.T. Indosat should therefore also join these organizations, attending meetings and obtaining reports, etc.

CHAPTER III

11.



11. Finance

11.1 Corporate Financial Plan for P.T. Indosat

In the coming several years, P.T. Indosat's revenues are expected to increase substantially because of the favorable condition surrounding international telecommunications. Telephone revenue is, among all, the most important factor in growth. Telex service will be facing stiffer competition from such services as leased circuits, packet switching and facsimile, but it continues to contribute to the revenue base. (See Table 11.1.1 pro forma income statement)

New services such as packet switching may have a bright future. During the coming several years, however, their share in the total P.T. Indosat's revenue is very small compared with those of telephone and telex. Consequently, the average annual growth rate of total revenues is approximately 20% for the period from 1983 to 1989.

On the other hand, the biggest factor in the total expenses is the operation expense, most of which is accounted for by the compensation to PERUMTEL. If the calculation should be based strictly on the current PERUMTEL tariff, the compensation would amount to as much as approximately 50% of the total expenses.

From the viewpoint of worldwide trend for decreasing international telecommunications tariff, the strict application of the current tariff would be a burden on P.T. Indosat. Therefore, some measures should be taken to improve this situation, while keeping good relationship with PERUMTEL. (Although the base for calculation is different, the ratio of compensation to NTT out of KDD's total expenses is approximately 14%.)

Other items in expenses can be managed quite favorably by P.T. Indosat. Personnel expense would become the second biggest item. But, the ratio within total expenses is far below the level of KDD.

The active investment in cables and gateway buildings will also increase the fixed assets. In 1989, the total fixed

assets will be more than 4 times as those in 1983. (See Table 11.1.2 pro forma balance sheet)

The attached figure shows the growth of total revenues, total expenses and accumulated investment until 1989. As to the assumptions and method of financial simulation model adopted for this analysis, refer to appendix to this report.

Table 11.1.1.1 INCOME STATEMENT

	(million Rp.)							
	1983	1984	1985	1986	1987	1988	1989	TOTAL
TELEPHONE REVENUE	54,521	70,059	88,417	108,750	133,980	164,126	200,233	820,085
TELEX REVEUE	28,425	33,257	38,911	44,943	51,459	58,149	65,126	320,270
TELEGRAM REVENUE	978	857	753	663	582	515	458	4,806
LEASED CIRCUIT-TG	205	219	230	239	248	255	260	1,655
LEASED CIRCUIT-VG	77	96	122	147	173	201	229	1,046
TELEVISION REVENUE	93	102	111	120	129	138	147	837
BUREAUFAX REVENUE	3	9	19	34	52	70	89	276
PACKET SWITCHING	0	0	44	313	546	907	1,343	3,154
INTELSAT RETURN	981	1,138	1,181	1,394	1,588	1,806	2,050	10,138
TDMA REF STATION	0	57	170	170	170	170	170	907
<u>TOTAL OPERATION</u>	<u>85,284</u>	<u>105,793</u>	<u>129,956</u>	<u>156,773</u>	<u>188,927</u>	<u>226,337</u>	<u>270,105</u>	<u>1,163,170</u>
REVENUES	85,284	105,793	129,956	156,773	188,927	226,337	270,105	1,163,170
INTEREST FROM								
DEPOSIT	3,700	4,100	4,500	4,900	5,300	5,700	6,100	34,300
<u>TOTAL REVENUES</u>	<u>88,984</u>	<u>109,893</u>	<u>134,456</u>	<u>161,673</u>	<u>194,227</u>	<u>232,037</u>	<u>276,205</u>	<u>1,197,470</u>
PERSONNEL EXPENSE	5,167	7,191	9,318	11,160	12,520	15,069	17,855	78,280
OPERATION EXPENSE	22,722	33,989	39,568	48,242	57,937	69,792	83,865	356,114
MAINTENANCE EXPENSE	1,408	1,722	2,916	4,769	5,431	6,014	6,372	28,631
DEPRECIATION EXPENSE	1,565	2,013	2,992	4,466	5,509	6,038	6,511	29,095
GEN ADMINISTRATION	1,656	2,192	2,756	3,277	3,668	4,365	5,104	23,017
INTEREST EXPENSE	3,436	4,873	7,156	6,480	5,503	4,697	3,969	36,114
AMORTIZATION GOODWILL	1,902	1,902	1,902	1,902	1,902	1,902	1,902	13,312
<u>TOTAL EXPENSES</u>	<u>37,856</u>	<u>53,881</u>	<u>66,608</u>	<u>80,296</u>	<u>92,469</u>	<u>107,875</u>	<u>125,578</u>	<u>564,562</u>
PROFIT BEFORE TAX	51,128	56,012	67,848	81,377	101,757	124,162	150,627	632,911
CORPORATE TAX	23,008	25,205	30,532	36,620	45,791	55,873	67,782	284,810
<u>PROFIT AFTER TAX</u>	<u>28,121</u>	<u>30,807</u>	<u>37,317</u>	<u>44,757</u>	<u>55,967</u>	<u>68,289</u>	<u>82,845</u>	<u>348,101</u>

Table 11.1.1.2 BALANCE SHEET

	(million Rp.)							
	1983	1984	1985	1986	1987	1988	1989	TOTAL
CASH AND BANK	1,202	1,170	1,555	2,655	4,358	6,635	9,497	27,072
TIME DEPOSIT	10,815	10,532	13,992	23,898	38,222	59,718	85,475	243,651
A/R FROM PERUMTEL	6,993	8,681	10,673	12,862	15,501	18,565	22,151	95,426
A/R FROM PTT	2,937	3,646	4,485	5,415	6,532	7,832	9,354	40,201
INT/R	148	164	180	196	212	228	244	1,372
ADVANCE PAYMENT	1,780	2,198	2,689	3,233	3,885	4,641	5,524	23,950
TOTAL CURRENT ASSETS	<u>23,876</u>	<u>26,391</u>	<u>33,574</u>	<u>48,260</u>	<u>69,709</u>	<u>97,619</u>	<u>132,244</u>	<u>431,671</u>
E/S NO.1	5,248	5,613	6,338	6,788	7,288	8,313	9,263	48,851
E/S NO.2	3,210	3,625	4,125	4,625	5,125	6,125	7,125	33,960
ASEAN CABLE	23,821	33,172	48,792	74,315	94,315	97,850	102,685	474,980
NON-ASEAN CABLE/IRU	759	809	859	909	959	1,009	1,059	6,363
BLG/HSG/OFFICE	279	279	8,889	22,603	22,603	25,753	25,753	106,159
OFFICE FURNITURE	814	914	1,014	1,264	1,764	2,514	3,264	11,548
VEHICLES	372	472	572	822	1,322	1,572	1,822	6,954
TOTAL FIXED ASSETS	<u>34,503</u>	<u>44,884</u>	<u>70,589</u>	<u>111,326</u>	<u>133,406</u>	<u>143,136</u>	<u>150,971</u>	<u>688,815</u>
ACCUMULATED DEPRECIATION	8,633	10,646	13,638	18,105	23,614	29,652	36,163	140,450
BOOK VALUE	<u>25,870</u>	<u>34,238</u>	<u>56,951</u>	<u>93,221</u>	<u>109,792</u>	<u>113,484</u>	<u>114,808</u>	<u>548,365</u>
ASSETS ON CONSTRUCTION	30,514	46,389	52,686	21,614	8,264	7,964	10,964	178,395
GOODWILL	11,411	9,509	7,607	5,705	3,803	1,901	0	39,936
TOTAL ASSETS	<u>91,670</u>	<u>116,527</u>	<u>150,817</u>	<u>168,800</u>	<u>191,568</u>	<u>220,968</u>	<u>258,016</u>	<u>1,198,370</u>
TAX/P	1,917	2,100	2,544	3,052	3,816	4,656	5,648	23,733
A/P TO PERUMTEL	1,454	2,332	2,743	3,358	4,039	4,893	5,926	24,746
A/P TO PTT	2,937	3,646	4,485	5,415	6,532	7,832	9,354	40,201
CABLE MAINT/P	51	71	103	157	199	206	216	1,003
SATELLITE CCT/P	107	148	191	239	287	354	419	1,744
INT/P	859	1,218	1,789	1,620	1,376	1,174	992	9,028
CURR PORT OF LONG L	7,900	6,602	6,713	6,514	5,378	4,850	4,850	42,807
OTHER CURR LIABILITY	0	839	0	0	0	0	0	839
TOTAL CURR LIABILITY	<u>15,226</u>	<u>16,957</u>	<u>18,568</u>	<u>20,354</u>	<u>21,625</u>	<u>23,965</u>	<u>27,405</u>	<u>144,100</u>
LONG TERM LIABILITY	15,007	25,605	40,992	36,688	31,310	26,460	21,610	197,672
DIFFERENCE IN ASSETS	(5,107)	(5,107)	(5,107)	(5,107)	(5,107)	(5,107)	(5,107)	(35,749)
TRANSFER	27,260	27,260	27,260	27,260	27,260	27,260	27,260	190,820
PAID STOCK	11,163	21,005	31,788	44,848	60,513	80,102	104,003	353,422
DEVELOPMENT FUND	28,121	30,807	37,317	44,757	55,967	68,289	82,845	348,101
CURRENT YEAR PROFIT	91,669	116,527	150,817	168,800	191,568	220,968	258,016	1,198,370
TOTAL LIABILITIES	<u>91,669</u>	<u>116,527</u>	<u>150,817</u>	<u>168,800</u>	<u>191,568</u>	<u>220,968</u>	<u>258,016</u>	<u>1,198,370</u>

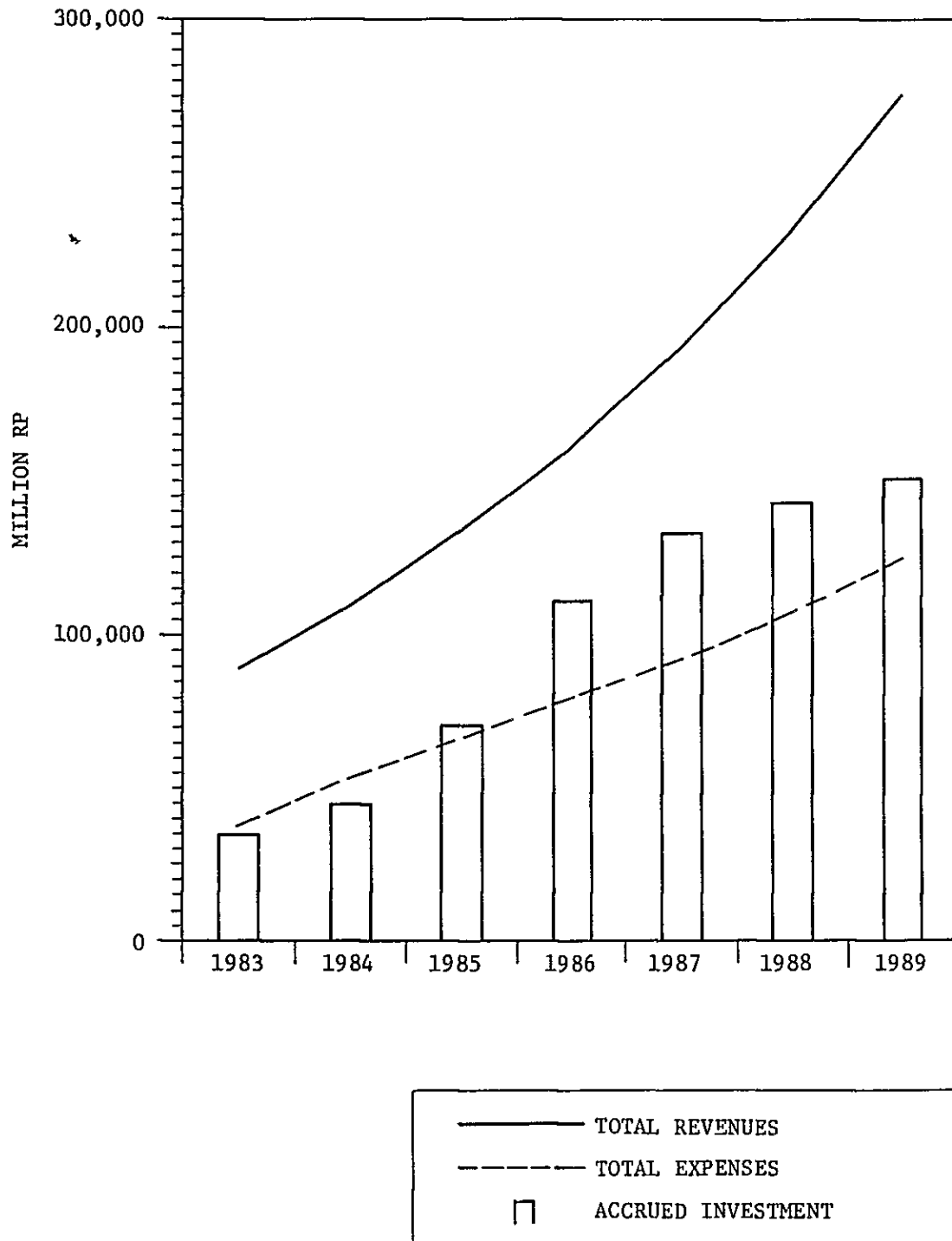
Table 11.1.1.3 CASH FLOW

	1983	1984	1985	1986	1987	1988	1989	TOTAL
								(million Rp.)
OPERATION INCOME	88,051	102,978	126,634	153,109	184,519	221,216	264,114	1,140,620
INTEREST INCOME	3,852	4,084	4,484	4,884	5,284	5,684	6,084	34,456
NEW LOANS	9,596	18,039	22,100	2,210	0	0	0	51,945
<u>TOTAL INCOME</u>	<u>101,499</u>	<u>125,101</u>	<u>153,218</u>	<u>160,203</u>	<u>189,803</u>	<u>226,900</u>	<u>270,198</u>	<u>1,226,920</u>
TOTAL COSTS	32,810	43,446	53,234	65,801	77,667	93,010	110,566	476,533
INVESTMENT	27,745	26,256	32,002	9,665	8,730	9,430	10,835	124,663
DIVIDEND	13,850	16,872	18,484	22,390	26,854	33,580	40,973	173,003
CORPORATE TAX	27,249	25,002	30,088	36,112	45,027	55,033	66,790	285,321
REPAYMENT OF LOANS	3,088	7,900	7,441	6,713	6,514	5,378	4,850	41,884
INTEREST EXPENSE	2,707	4,514	6,585	6,649	5,747	4,898	4,151	35,252
EMPLOYEE BENEFIT	1,154	1,406	1,540	1,866	2,238	2,798	3,414	14,417
<u>EXPENDITURES TOTAL</u>	<u>75,793</u>	<u>81,970</u>	<u>96,140</u>	<u>83,395</u>	<u>95,110</u>	<u>111,117</u>	<u>131,013</u>	<u>674,539</u>
CASH IN/OUT	(7,104)	(315)	3,844	11,007	17,026	22,773	28,619	75,851
BEGIN OF YEAR CASH AND TIME DEPOSIT	<u>19,121</u>	<u>12,017</u>	<u>11,702</u>	<u>15,546</u>	<u>26,553</u>	<u>43,580</u>	<u>66,353</u>	<u>194,873</u>
<u>END OF YEAR CASH AND TIME DEPOSIT</u>	<u>12,017</u>	<u>11,702</u>	<u>15,546</u>	<u>26,553</u>	<u>43,580</u>	<u>66,353</u>	<u>94,972</u>	<u>270,723</u>

Table 11.1.4 RATIOS FOR FINANCIAL ANALYSIS

	1983	1984	1985	1986	1987	1988	1989
RETURN ON OWNERS EQUITY (%)	42.26	38.96	38.72	38.30	38.94	38.88	38.69
OPERATING RETURN (%)	51.74	44.55	42.00	45.31	50.35	53.61	56.01
PROFIT MARGIN (%)	32.97	29.12	28.71	28.55	29.62	30.17	30.67
ASSETS TURN OVER	0.93	0.91	0.86	0.93	0.99	1.02	1.05
GROWTH RATE OF REVENUE (%)	28.29	24.05	22.84	20.63	20.51	19.80	19.34
CURRENT RATIO (%)	156.81	155.63	180.81	237.10	322.35	407.34	482.55
DEBT/EQUITY RATIO (%)	34.42	40.73	49.51	36.97	25.52	17.83	12.36
OPERATING RATIO (%)	44.39	50.93	51.25	51.22	48.94	47.66	46.49

Figure 11.1.1 Financial Conditions for P.T. Indosat



11.2 Financial Analysis for New Service and Third Gateway

This section shows the financial analysis for maritime satellite and the third gateway by using Net Present Value (NPV) as criteria. NPV is, in general, shown by the following formula :

$$\sum_{t=1}^n \frac{B_t}{(1+i)^t} - \sum_{t=1}^n \frac{C_t}{(1+i)^t} = \text{NPV}$$

where

B_t	: Benefit at some year
C_t	: Cost at some year
i	: Discount rate
n	: Project life

If the NPV is larger than zero, the project is feasible from the financial point of view. Regarding the period of project life, the durable years of the telecommunication equipment are often set to 20 years after the practice of the World Bank. When taking into consideration the remarkable and accelerating progress of the telecommunication technology in the recent years, uniform application of the durable years of 20 years are not considered to be appropriate. So in this analysis the durable years are set to 10 - 15 years.

11.2.1 Maritime Satellite Communication

In this master plan, it is assumed that the traffic demand will be originated from ships over 5000 tons. In 10 years from the start of this service, the traffic will increase around 12 times. However, the absolute traffic value is small. Introduction of maritime satellite service is not feasible, at least, for the time being. Table 11.2.1 shows the calculation of the NPV of maritime satellite communication, and the NPV is less than zero for discount rate of either 10 or 20 percent.

As mention above, we assumed that the traffic is originated from only ships. However, there are oil rigs around

Indonesian offshore. In case of including the traffic originated from oil rigs, the value of NPV may be increased a little more. In this master plan, P.T. Indosat is recommended to introduce this service via a foreign coast earth station at the initial stage. After it stimulates the latent demands and secures the sufficient traffic, P.T. Indosat should install its own coast earth station.

Sample analysis for INMARSAT services

Assumptions :

1. Demand Forecast

time	1	2	3	4	5	6	7	8	9	10
Telephone (x 1000)	16	22	32	46	66	89	109	131	157	188
Telex (x 1000)	34	48	68	99	140	188	232	278	334	401

2. Project Lifespan (=equipment lifespan) : 10 years

3. Depreciation of equipment : Building 35 years
Facilities 10 years

4. Investment : Rp 10.8 mil (building:Rp 40,000x 270m²)
+ ¥ 3,100 mil (2 antenas, transmitters, etc.)

5. Loan ¥ 3,100 mil 7 years semiannual equal amount payment
interest rate 15%

6. Rp/¥ = 2.55, Rp/\$ = 625

7. Maintenance Cost : Rp. 791.6 mil per year (10% of investment)

Personnel " : Rp 5 mil x 8 persons

Property Tax : Rp 39.6 mil (0.5% of investment)

Other " : Rp 3 mil

Rp 874.2 mil

8. Satellite space segment cost :

Telephone : \$ 5.25 per minute (chargeable)

Telex : \$ 2.40 per minute (chargeable)

Table 11.2.1 Financial Analysis for Maritime Satellite Communication Services

million Rp.

	1	2	3	4	5	6	7	8	9	10
1. Telephone Revenue	90	123	179	258	370	498	610	733	879	1053
2. Telex "	102	144	204	297	420	564	696	834	1002	1203
3. Total Revenue	192	267	383	555	790	1062	1306	1567	1881	2256
4. Depreciation	791	791	791	791	791	791	791	791	791	791
5. Interest	1160	1051	925	779	610	416	191	-	-	-
6. Repayment of Loan	702	812	938	1083	1252	1447	1680	-	-	-
7. Other cost	874	974	874	874	874	874	874	874	874	874
8. Satellite Circuit	103	144	207	299	427	574	706	847	1016	1218
9. Total Cost	3630	3672	3735	3826	3954	4102	4242	2512	2681	2883
10. Net Cash	-3438	-3405	-3352	-3271	-3164	-3040	-2936	-945	-800	-627

Discount Rate 10% : NPV = -10,885

20% : NPV = -10,216

Remarks : For calcuation of NPV, cost of depreciation, interest and repayment of Loan were deleted.

9. Tariff :

Telephone : Rp. 5,600 per minute
Telex : Rp. 3,000 per minute

11.2.2 Third Gateway

At present, international calls to and from Eastern part of Indonesia takes only small portion of total Indonesian international telecommunications.

PERUMTEL is, however, planning to enhance the domestic network in the Eastern part of Indonesia.

After around 1990 therefore, we assumed that the traffic to and from Eastern part of Indonesia would increase considerably.

The traffic to and from Eastern part of Indonesia is concentrated on Surabaya, so we further assumed that the third gateway would be installed at Surabaya after 1990, and that the major facilities would be earth stations for IRO, POR, telephone & telex switchings and carrier systems. Table 11.2.2 shows the financial analysis for the third gateway.

The NPV is 6863 and 22504 for the discount rate of 15% and 10% respectively.

Therefore, the conclusion can be drawn that this project is quite feasible from the financial point of view.

Sample analysis for Third Gateway

Assumptions :

1. Demand Forecast :

	1990	1994	2000
Telephone (x 1,000) minutes	12,210	36,630	91,575
Telex (x 1,000)	3,925	9,813	19,625

2. Tariff : Telephone and Telex Rp1000/min.

3. Investment :

Building	5,000 mil Rp
Telephone Sw.	3,000
Telex Sw.	2,000
Power	3,000
Earth Stations	10,000
Carrier Systems	2,000
	<hr/>
	25,000

4. Running Costs :

	1990	1994	2000	Note
① Operator (No.)	120 (60)	240 (120)	440 (220)	Rp2 mil/person
② Maintenance	1,500	2,500	4,000	6% of investment
Satellite Space Segment	669	1,655	4,224	
Domestic Compensation	12,720	37,145	90,520	traffic handling charge intergateway
Administration	162	274	444	(① + ②) x 10%

5. Depreciation :

Building	35 years
Facilities	15 years

6. Loan : 20,000 mil Rp 7 years semiannual equal amount
interest rate 15%

7. Property Tax :

interest rate 0.5% : for over 15 mil Rp of fix assets

Table 11.2.2 Financial Analysis for Third Gateway

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1. Revenue (TP + TLX)	16135	22747	30003	37901	46443	55628	65456	75927	87042	98799	111200	124244	137931	152261	167235
2. Investment Cost	25000														
3. Running Cost	15171	20939	27303	34261	41814	49962	58705	68044	77977	88505	99628	111346	123659	136567	150070
4. Depreciation	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467	1467
5. Property Tax	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
6. Loan: Capital Repayment	1776	2054	2372	2740	3168	3660	4250								
Interest Payment	2936	2658	2340	1970	1544	1052	482								
7. Total Cost	21475	27252	33616	40572	48127	56275	65038	69645	79578	90106	101229	1112947	125260	138168	151671
8. Net Cash	-5349	-4505	-3613	-2617	-1684	-647	-418	6282	7464	8093	9971	11297	12671	14093	15564

mil Rp

Discount Rate 15% : NPV = 6863.3

10% : NPV = 22503.7

Remarks : For calculation of NPV, costs of depreciation, property tax,
and Loan were deleted.

