NO

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF INTERNATIONAL TELEPHONE SWITCHING SYSTEM
IN
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

MARCH 2003

JAPAN INTERNATIONAL COOPERATION AGENCY
KDDI ENGINEERING AND CONSULTING, INC.
JAPAN TELECOMMUNICATIONS ENGINEERING AND CONSULTING SERVICE

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PREFACE

In response to a request from the Government of the Lao People's Democratic Republic, the Government of Japan decided to conduct a basic design study on the Project for Improvement of International Telephone Switching System in the Lao People's Democratic Republic and entrusted the study to the Japan International Cooperation Agency (JICA).

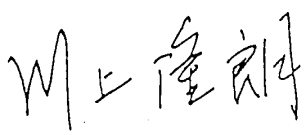
JICA sent to Lao PDR a study team from 4 November to 7 December 2002.

The team held discussions with the officials concerned of the Government of Lao PDR, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Lao PDR in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Lao People's Democratic Republic for their close cooperation extended to the team.

March 2003



Takao Kawakami
President
Japan International Cooperation Agency

March 2003

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of International Telephone Switching System in the Lao People's Democratic Republic.

This study was conducted by the joint venture between KDDI Engineering and Consulting, Inc. and Japan Telecommunications Engineering and Consulting Service, under a contract to JICA, during the period from October, 2002 to March, 2003. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Lao PDR and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

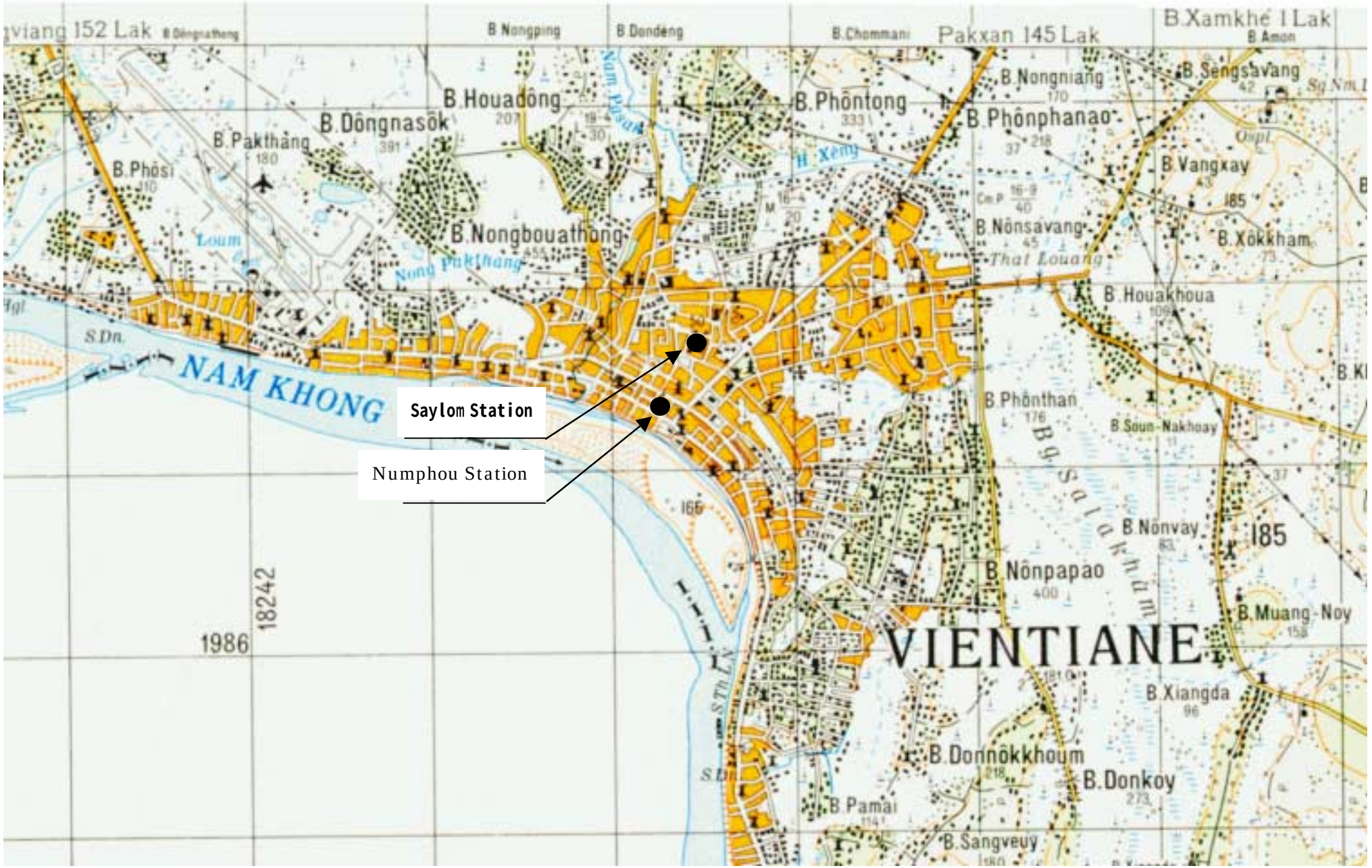
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Toru Kizuka
Project manager,
Basic design study team on the Project for
Improvement of International Telephone
Switching System in the Lao People's Democratic
Republic

The joint venture between
KDDI Engineering and Consulting, Inc. and
Japan Telecommunications Engineering and
Consulting Service

The People' s Democratic Republic



Project Sites

THE PROJECT EOR IMPROVEMENT OF INTERNATIONAL TELEPHONE SWITCHING SYSTEM IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

List of Tables and Figures

Abbreviations

ASEAN	Association of South-East Asian Nations
ccTLD	Country Code Top-Level Domain
CSC	China-Southeast Asia Cable System
DDF	Digital Distribution Frame
DPT	Department of Posts and Telecommunications
E1	European Standard, Primary Digital Group
ETL	Enterprise of Telecommunications Lao
GCE	Ground Communication Equipment
GSM	Global System for Mobile Communication
IDD	International Direct Dialing
IDR	Intermediate Data Rate
INTS	International Transit Switch
IP	Internet Protocol
ISC	International Switching Center
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ISUP	ISDN User Part
IT	Information Technology
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
IX	Internet eXchange
Kbps	Kilo bits per second
LAN	Local Area Network
Lao PDR	Lao People's Democratic Republic
LAT	Lao Asia Telecom
LTC	Lao Telecommunications
LRE	Low Rate Encoding (Low Rate Encoder)
Mbps	Mega bits per second
MCTPC	Ministry of Communication, Transport, Post and Construction
MUX	Multiplex
OECD	Organization Economic Cooperation and Development

O&M	Operation and Maintenance
OLTE	Optical Line Transmission Eq1uipment
PABX(PBX)	Private (Automatic) Business Exchange
PCM	Pulse Code Modulation
PDH	Presiochronous Digital Hierarchy
PS(EG)	Power Supply(Engine Generator)
PSTN	Public Switched Telephone Network
R2	Signaling System based on ITU recommendation R2
RSU	Remote Switching Unit
RX	Receiver
SDH	Synchronous Digital Hierarchy
SP	Signaling Point
STP	Signaling Transfer Point
SS No.5	Signaling System Number 5 (N5)
SS No.7	Signaling System Number 7 (C7 / SS7)
STEA	Science, Technology and Environment Agency
STM-1	Synchronous Transfer Mode, Level 1
TLS	Toll Local Switch
TUP	Telephone User Part
TX	Transmitter
UNDP	United Nations Development Programme
UPS	Uninterruptible Power Supply
VoIP	Voice Over Internet Protocol
VSAT	Very Small Aperture Terminal
VTE	Vientiane

SUMMARY

Summary

The Lao People's Democratic Republic (herein-after referred to as “Lao PDR”), located roughly in the center of the Greater Mekong Sub-region, has the potential of becoming this region's central corridor, where information and commodities are exchanged and/or accumulated. However, Lao PDR currently falls short of reaching its neighboring countries' level of information technology (IT) due to a poor telecommunications infrastructure, let alone its insufficient basic telephone service, which is one of the causes that hinder its national economic development. On the other hand, Lao PDR is expected to play a more important role in the global community, as exemplified by its task for the first time to host the ASEAN Summit Conference to be held in November 2004. Under these circumstances, Lao PDR is promoting the development of a telecommunications infrastructure, one of the basic social assets. Being ranked as the Least Among Less-developed Countries (LLDC) with a per capita gross domestic product (GDP) of around 280 dollars, Lao PDR can shoulder only a limited amount of economic burdens for its infrastructure development. Also, with a serious shortage of budgets, the country is having difficulties in purchasing telecommunication equipment, which requires foreign currencies.

The existing international telephone switching system with a guaranteed after-sales service period expiring in March 2008, when any supports from the manufacturer may discontinue, must be replaced with a new one, particularly in the field of international telephone communications. Furthermore, the existing system does not support the international signaling system No.7, a global standard of signaling systems. If a destination country to which a direct circuit should be established supports only the international signaling system No.7, Lao PDR, having to re-route an international call via a third country, will suffer an economic loss caused by additional transit charges.

The Lao Government requested thus the Japanese Government to provide a grant aid covering purchase and installation of a new international switching system, a basic telecommunications infrastructure and an important system for international communications, as well as the development of IT infrastructures in its capital Vientiane in order to narrow the disparity in the IT field. The request concerns these components: (1) Installation of an international telephone switching system, (2) Modification of the existing international-domestic combined switching system for sole use for domestic calls, (3) Expansion of the international satellite communication system, (4) Laying of high-speed data communication circuits (fiber optic cables), and (5) Installation of Internet servers. The installation of an international telephone switching system was proposed as a priority Project

also in the development study (The Study on the Telecommunications Development in Lao PDR) conducted as technical assistance by the Japanese Government from October 2001 to November 2002.

Upon receiving this request, the Japanese Government decided to carry out the basic design study on "The Project for Improvement of IT Facilities in Vientiane City" and dispatched a basic design study team to Lao PDR from November 4 to December 7, 2002.

During the field survey, the study team had discussions with the Lao Government's officials to confirm the contents of their plan and request, and studied the existing conditions of the systems, equipment, and operations related to the contents of the request.

As a result, the study team confirmed with the Lao officials that the contents of the request are ultimately as follows and continued its study back in Japan.

(1) Installation of an international telephone switching system,
(2) Modification of the existing international-domestic combined switching system for sole use for domestic calls,
(3) Expansion of the international satellite communication system,
(4) Establishment of a fiber optic cable network intended as an IT infrastructure in the central part of the capital to form an Intranet connecting the governmental offices, and
(5) Installation of an Internet exchange connecting multiple Internet service providers (ISPs).

As a result of study continued in Japan, the study team chose as the Project goals only the installation of an international telephone switching system and the modification of the existing international-domestic combined switching system for sole use for domestic calls and decided to exclude the other Project components because of the following reasons:
(1) Expansion of the international satellite communication system: The demand is not expected for the time being to exceed the current spare capacity.
(2) Establishment of a fiber optic cable network: The Lao Government did not have a basic plan for the Project nor clearly identify the specific effects in the operations of the governmental offices.
(3) Installation of an Internet exchange: This may cause a squeeze on the private sector. Furthermore, the installation of such an exchange seems unnecessary in the current Internet environment of Lao PDR where there are as few as three Internet service providers (ISPs).

Based on the above results of analysis made in Japan, a study team for explaining the draft report of the basic design was dispatched to Lao PDR from February 17 to 26, 2003. The study

team explained the draft report of the basic design and discussed it with the Lao Government's officials. Both parties basically agreed on the contents of the draft report, as well as on the new Project title that would be changed to "The Project for Improvement of International Telephone Switching System in the Lao People's Democratic Republic."

In the Project thus concluded, the Japanese Government would provide a grant aid for procurement and installation of an international telephone switching system. It will also provide the required technical assistance by means of soft-components to transfer of international circuits and modification of the existing international-domestic combined switching system to be implemented at the cost of the Lao Government.

In this Project, one international telephone switching system will be procured and installed in the Saylom Office in the Municipality of Vientiane.

The duration required for the Project will be 3.5 months for the implementation design and 12.5 months for procurement and installation.

The expected direct effects of this Project are as follows:

(1) Continuous stable supply of the international telephone service

The demand for international calls placed by the citizens, the Government, and corporations will be satisfied. A stable supply of the international telephone service throughout Lao PDR will be ensured.

(2) Reduction of transit charges

The new switching system, based on the international signaling system No.7, a required international communication function, can establish direct circuits with international communication destinations with less restrictions. Thus, any transit of an international call via a third country, can be eliminated as much as possible and the payment of transit charges be suppressed.

The expected indirect effects are as follows:

(1) Supply of foundation for promoting globalization

Lao PDR, a member of ASEAN from 1997, is developing an increasingly closer relation with neighboring regions and the global community. Smooth operations of the international communication service will play an important part in internationalization in terms of political, cultural, and economic exchanges.

(2) Increase of trunk capacity for domestic interconnection on the existing combined switching system

The domestic trunk capacity of the existing combined switching system will be increased because the international trunks can be diverted for domestic use after the transition of international circuits and rearrangement of the data on the existing switching system are carried out when a new international telephone switching system is introduced.

On the other hand, the operation and maintenance of a executing agency necessary to implement this Project will require the increase in the number of employees (around five) and the shouldering of maintenance costs of approximately 20 million yen per year. However, the burden and costs seem to be realistic.

In conclusion, it is appropriate that this Project, which will offer enormous benefits to the people of Lao PDR, freeing it from any particular problem with operation and maintenance, be implemented under the grant aid scheme of the Japanese Government.

Contents

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Chapter 1 Background of the Project

Chapter 1 Background of the Project

1-1 Background and Outline of the Request

The Lao People's Democratic Republic (herein-after referred to as “Lao PDR”), located roughly in the center of the Greater Mekong Sub-region (GMS), has the potential for becoming this region's central corridor, where information and commodities are exchanged and/or accumulated. However, Lao PDR currently falls short of reaching its neighboring countries' level of information technology (IT) due to a poor telecommunications infrastructure, which is one of the causes that hinder its national economic development. On the other hand, since introducing an economic renovation (called as “new economic mechanism“) in 1986, Lao PDR is expected to play a more important role in the ASEAN community, as exemplified by its task for the first time to host the ASEAN Summit Conference to be held in November 2004. Until now, Japan has contributed much to the telecommunications sector in Lao PDR by developing such as telephone networks and international communication facilities through grant aid. Moreover, a development study for telecommunications development plan was carried out from October, 2001 through November, 2002. Under these circumstances, Lao PDR requested Japan a grant aid described below in order to bridging the digital divide.

(1) Installation of international telephone switching system

At present international telephone service is provided by an international-domestic combined switching system in Lao PDR. However, it has certain limitations for the capacity and the functions, especially lack of international No.7 signaling system. To overcome these limitations, a new international telephone switching system was requested to be installed in ETL.

(2) Modification to existing international-domestic combined switching system for domestic use

When a new international telephone switching system is introduced, the existing international- domestic combined switching system shall be modified for domestic use.

(3) Expansion of international satellite communication system

To cope with IT services and to resolve the current capacity limitation, the existing international satellite communication circuits are to be expanded and made higher speed.

(4) High-speed data communication channels (Fiber-optic cables)

Five different establishments in Vientiane Municipality shall be connected through data channels by means of fiber-optic cables.

(5) Installation of Internet server

In order for the users to utilize domain names under the Lao's country identification of ".la", a main Internet server is requested.

1-2 Results of the Examination on the Request

Each component described above was thoroughly discussed and examined not only during the field survey but also during the study in Japan. The study on each component concludes as follow:

(1) Installation of a new international telephone switching system

It is considered necessary that an international telephone switching system should be newly installed for the following reasons. Firstly, it is necessary to secure an international telephone switching system before March 2008 when the after-sales service for the existing international-domestic combined switching system expires (any supports from the manufacturer may discontinue at that time) and this may cause some hindrance for stable provision of international telephone service due to no guarantee of repair or supply of the equipment by the manufacturer after the expiration. It is regarded necessary to commence the purchase now because it may take several years for the purchase and installation of the equipment and transferring the telephone circuits. Secondly, international No.7 signaling

system, a current global standard for telecommunication signaling, cannot be accommodated to the existing international-domestic combined switching system and if a destination country to which a direct circuit should be established supports only the international No.7 signaling system, ETL, having to re-route an international call via a third country, will suffer an economic loss caused by additional transit charges. Because the transition from older version of signaling systems to No.7 signaling system in the world is rapid, installation of a new international telephone switching system should be commenced soon.

(2) Modification of the existing international-domestic combined switching system for domestic use

It was confirmed that there was no need to modify the hardware of the equipment as far as procurement of goods is concerned. ETL will only undertake establishing circuits and making routing for the new international telephone switching system, deleting unnecessary data and rearranging the cables. The consultant will give technical guidance to this work as a soft-component. The soft-component also includes works for identifying the reason of the system failures and for stabilization of the system.

(3) Expansion of satellite communication system

The existing satellite communication system has a transmission capacity of 16 IDR modems (2 Mbps maximum per modem) out of which 11 modems are in use but 5 modems are not in use. There is some plans to establish some circuits for the Internet and new destinations for international telephone services, but there is not enough justification for demand exceeding the current capacity of 16 modems in the target year of 2005.

(4) High-speed data communication circuits (Fiber-optic cable)

According to the original request, the locations to be connected with the network of this component were five places, namely a central government office, Dondok University, conference house, SPC building and MCTPC building. However, as the result of the confirmation and discussions made in the site survey, it was finally confirmed that the aim of

the component shall be to set up a governmental intranet and 17 locations of the central governmental offices in Vientiane City shall be connected with this network. Though this component is expected to take effect in the mid and long terms, there is no basic plan for this Project made by the Lao Government and each governmental office seems not to have concrete needs to use the intranet except connection to the Internet, use of email, and opening homepages. It appears concrete results are not clear when the Project is implemented. The IT infrastructure construction itself may not produce the intended results without fundamental plan of its usage. Therefore, it is not appropriate for the moment to implement the Project under the general grant aid scheme. Technical assistance, rather than equipment provision, to mature the plan of the Lao Government and to make it more concrete is considered necessary.

(5) Internet Exchange

Necessity and merits of Internet eXchange (IX) has been identified through the study. However, there is possibility of following problems when this component is implemented under a general grant aid scheme.

1) There might be some concerns for IX as a one-gateway.
   a) Internet exchange(IX) makes interconnections between ISPs. And essentially IX should be operated by an organization which is independent from ISPs. However, in Lao PDR, ETL which intends to be an ISP plans to own and operate an IX. In this case, ETL will have the exclusive connections to the international Internet back-bone in Lao PDR and can be predominant in terms of tariffs and quality of service to the other ISPs who wish to connect to the IX. This scheme may hinder the competition among the private ISPs.
   b) There might be a concern that variety of tariffs and quality of services may be lost because all ISPs will be connected to the Internet back-bone through the same equipment.

2) At present, the right to use most of the domain names under Lao ccTLD, ".la", is rent to a foreign entity and Lao PDR cannot use them by themselves. If such domain names can be stored in the IX in Lao PDR, traffic for such domain names does not need to route via

precious international circuits but just route within the country, giving a economical merit. However, due to unability of storing these domain names in a domestic system, such merit will deteriorate and the effect of grant aid is small.

3) At present, as the number of ISPs in Lao PDR is small as three or so, therefore, effect on introduction of IX is not sufficient in comparison with direct connections between ISPs.

Therefore, it is considered that this component is not suitable for general grant aid. In stead, technical assistance of trainings for the subjects of network, information processing and the Internet, etc. may be suitable.

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Change of Title for the Project

The original title of the Project, "The Project for Improvement of IT Facilities in Vientiane City", shall be change to "The Project for Improvement of International Telephone Switching System", according to the results of the examination of the request.

2-1-2 Background

International telecommunications in the Lao PDR is operated by Enterprise of Telecommunications Lao (ETL) in a monopoly basis. In Lao PDR an international-domestic combined switching system has been operating since 1993 when the system was introduced by a grant aid of Japan. Because only this system provides international telephone service in the country, this switching system plays a very important role in the country. The Government of Lao PDR, however, has decided to undertake a Project to introduce another new international telephone switching system due to several problems on the existing switching system described in the clause of 2-1-3.

2-1-3 Problems

The existing combined switching system has problems as follows:

(1) Production of the model of the combined switching system has been discontinued. After-sales service to be provided by the manufacturer is only valid up to March 2008, fifteen years after the completion of the construction of the system in 1993 and any supports from the manufacturer may discontinue at that time. Because there is no guarantee to secure the proper functioning of the only one equipment of international telephone

switching system in the country, it is necessary to renew the system now, considering a period of about 1.5 years for purchasing and a relatively long period for transferring the international circuits.

(2) The existing system cannot accommodate international Signaling System No.7 which is recommended by the International Telecommunication Union (ITU) and is now widely adopted by many countries worldwide as a global standard. As the number of the countries who use Signaling System No.5 is rapidly decreasing, it will soon be difficult to establish direct circuit connection with foreign countries freely, causing the possibility of financial demerit of increase of transit charges, if any third-country transit routing is imposed.

2-1-4 Outline of the Project

In order to maintain the international telephone service and to resolve the current problems, ETL will commence a Project to construct a new international telephone switching system, to transfer the circuits from the existing switching system to the new switching system and to put the existing system in a good condition for its transition to domestic use. The scope of the work to be done by Japan's grant aid is as follows:

(1) To purchase an international telephone switching system to be installed in an ETL's building in Saylom, Vientaine

(2) To carry out a technical assistance to put the existing international-domestic combined switching system in a good condition for its transition to domestic use

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

Capacity of the trunks of the new international telephone switching system shall correspond to the estimated demand up to the year 2005 (target-year), that is, one year after the system is put into service in 2004. From that time onward, ETL shall manage by themselves to procure necessary equipment for further increase of demand.

Signaling System No.7 shall be introduced for both international and domestic and the existing international circuits operated under Signaling System No.5 and R2 shall be converted to Signaling System No.7 during the planning of transfer of the circuits with foreign destinations. The system shall have expandability for VoIP system to be introduced in the future in order to secure longer use of the system by adapting to technological innovations.

2-2-2 Basic Plan (Equipment Plan)

An international telephone switching system will be installed in International Switching Center (Saylom ISC) in the second floor of the technical building of ETL located at Saylom in Vientiane City.

As the power generator and air-conditioners are already prepared, equipment of international telephone switching system with operation and maintenance terminals, peripherals, uninterruptible power supply (UPS) and digital distribution frame (DDF) will be newly installed.

Necessary transmission and circuit cables, data cables, and power and grounding cables are also installed from the new international telephone switching system to the interface points of the existing equipment in the same building.

In order to transfer the international telephone circuits, necessary number of the existing transmission lines between the Numphou office and the Saylom office should be assigned and used for inter-office circuits and routing to the Saylom office for the international circuits which are now terminated at the Numphou office.

Implementation of the Project consists of elements of (1) installation of an international telephone switching system, (2) connecting with the existing combined switching system, (3) planning and execution of circuit transition plan, and (4) connecting with the existing billing system. And, (5) technical assistance (soft-component) for maintenance of the existing combined switching system will also be done.

Each element is described as follows:

2-2-2-1 Installation of international telephone switching system

An international telephone switching system and associated digital distribution frame (DDF) will be installed in Saylom ISC.

The capacity of the international telephone switching system will satisfy the estimated demand of international telephone in the year 2005 in Lao PDR. The trunk capacity is estimated as 55 E1s (E1 means 2.048 Mbps transmission capacity)(refer to Appendis-6).

As for signaling system, Signaling System No.7, capable of higher-speed processing and higher reliability than older version of the signaling systems, will be introduced.

Existing operator positions continue to be used and no operator position is introduced in this Project.

2-2-2-2 Connection with the existing combined switching system

Necessary inter-office links between the new international telephone switching system and the existing combined switching system will be prepared for transition of the international telephone circuits when the international telephone switching system is installed. As the existing combined telephone switching system does not have enough spare trunks, necessary number of trunks for the transition should be derived from the existing inter-office circuits after optimal rearrangement of the trunks is done.

2-2-2-3 Circuit transition plan

When the Project is formally authorized, ETL should begin to negotiate with the foreign telecommunications carriers of the destination countries about circuit transition plan. Guidance for the circuit transition will be provided by the consultant using soft-component scheme. The negotiation should also cover the issues regarding signaling system, amendment of circuit capacity and discontinue of Low Rate Encoding (LRE).

If LRE is still to be used, negotiations should be made with the foreign carriers about establishing clear channels and editing 64 kbps time-slot, because Signaling System No.7 needs a clear channel of 64 kbps for its signaling transfer.

In order to introduce Signaling System No.7 in international circuits, acquisition of international point code (code for identification of each country, defined by ITU) is necessary. The acquisition is the responsibility for the telecommunication administration of Lao PDR, MCTPC, and ETL. When MCTPC applies for the international point code, then the acquisition may not take long time and no interference to the Project schedule is expected.

2-2-2-4 Connection with billing system

As its responsibility, ETL shall perform modification/expansion of its existing billing system and connect it to the newly installed international telephone switching system. ETL and LTC should coordinate with each other about the billing issues during the period of international circuit transition.

2-2-2-5 Maintenance for the existing combined switching system

After the completion of international circuit transition, unnecessary data on the existing switching system should be deleted, cables should be put in order, and the lines connected with the newly-installed international telephone switching system should be re-arranged. Technical guidance for eliminating potential troubles in the system and solving shortage of spare parts should be also

performed by the consultant using soft-component scheme.

2-2-3 Basic Design Drawings

Basic design drawings corresponding to the basic plan described above are shown as follows:

Figure 1 : Floor layout in Saylom ISC

Figure 2 : Configuration of International Telephone Switching System

Figure 3 : Conceptual Diagram of International Telephone Switching System

Figure 4 : Conceptual Diagram of Transmission and Switching Systems

Figure 5 : Conceptual Diagram of Circuits Transfer

Figure 6 : Conceptual Diagram of Billing

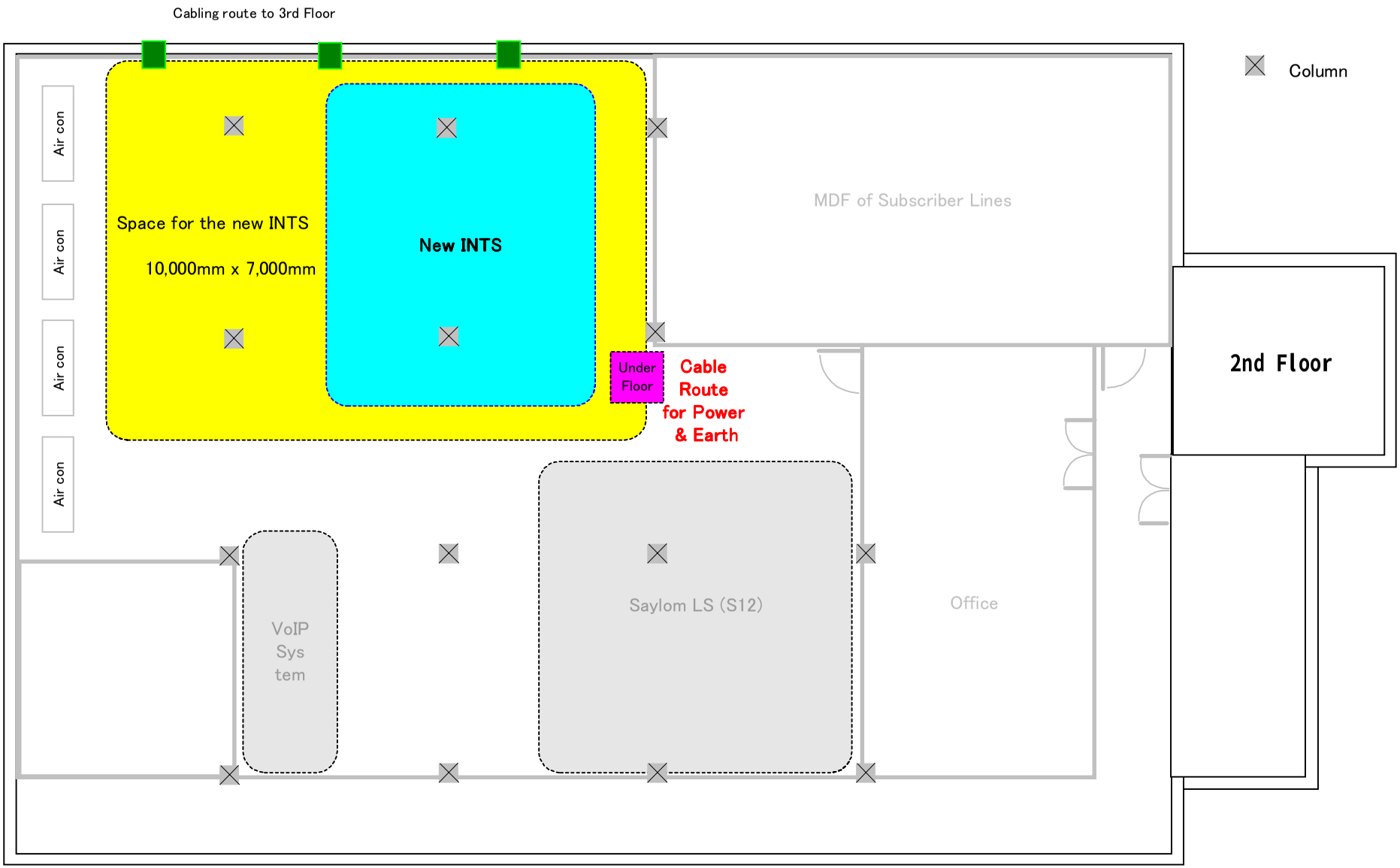


Figure 1 Floor Layout in Saylom ISC

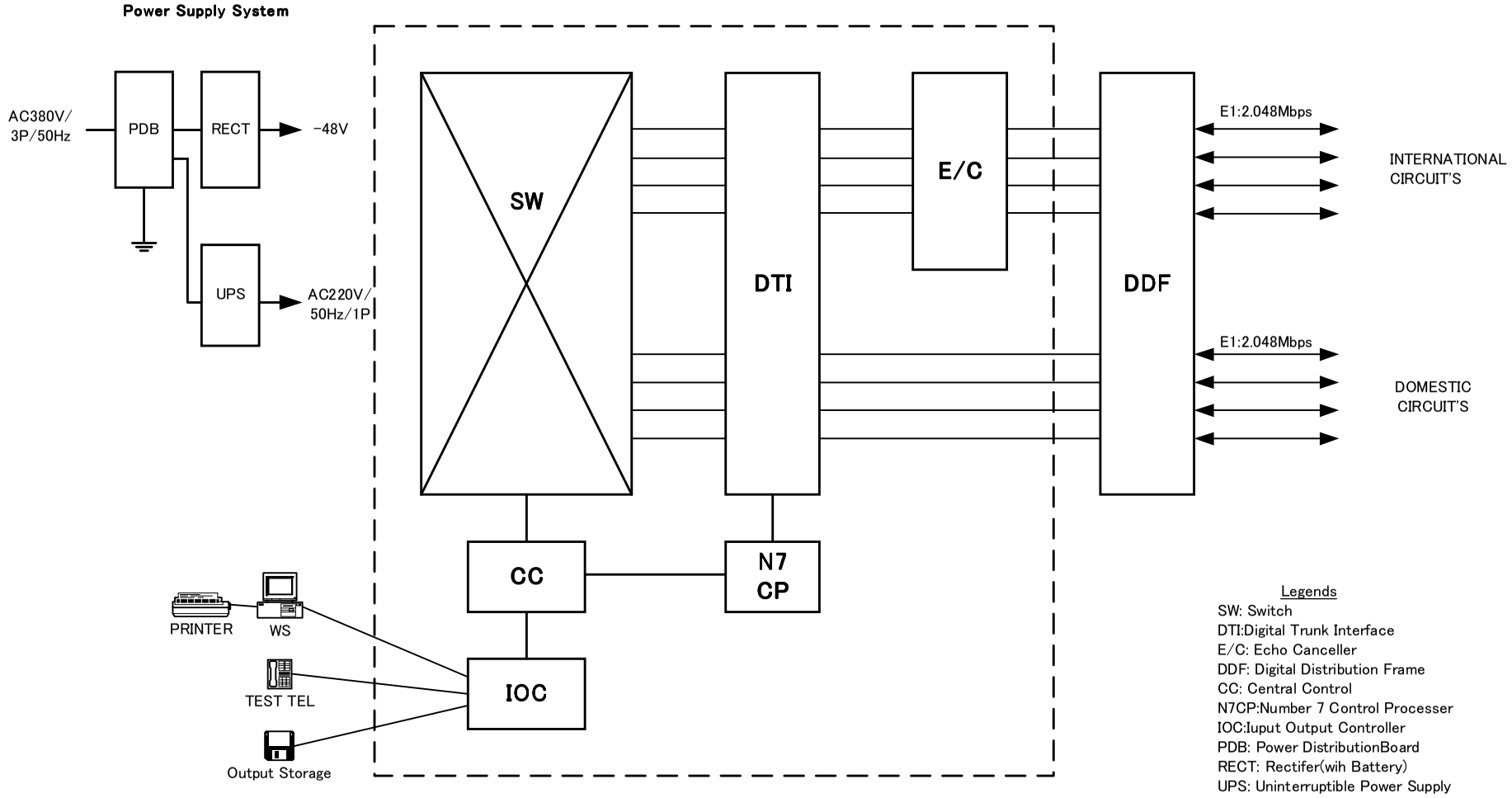


Figure 2 Configuration of International Telephone Switching System

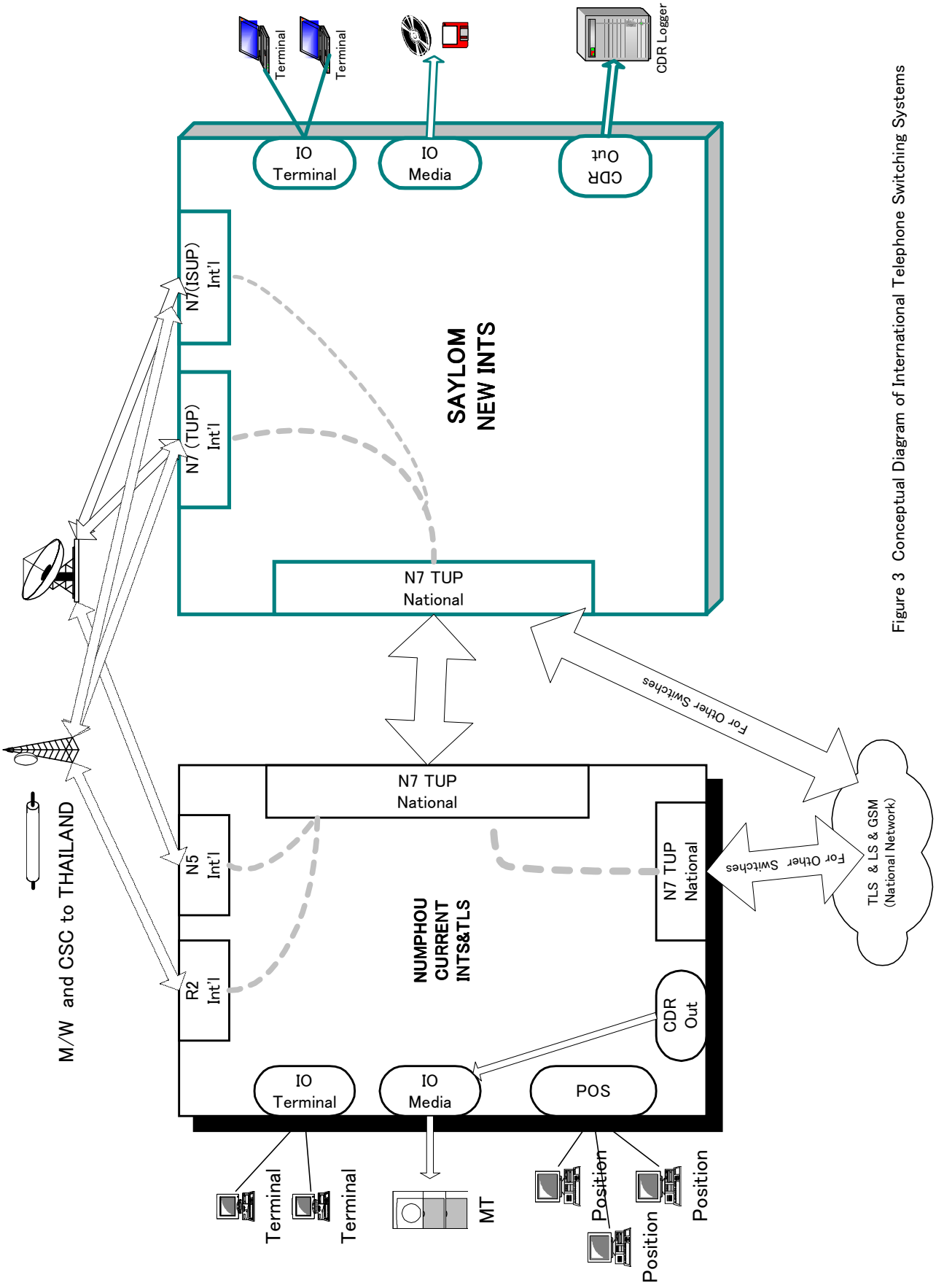


Figure 3 Conceptual Diagram of International Telephone Switching Systems

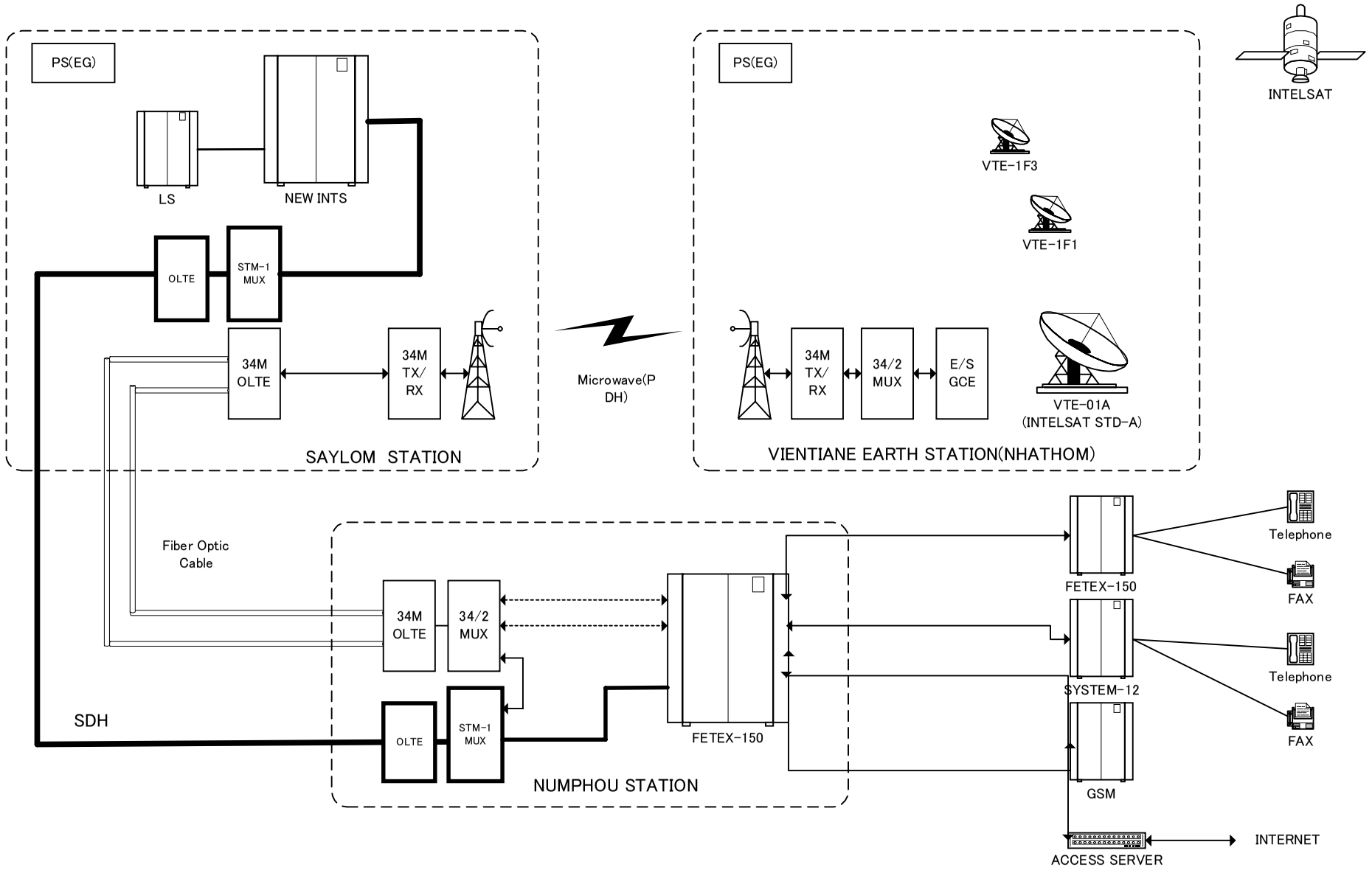


Figure 4 Conceptual Diagram of Transmission and Switching Systems

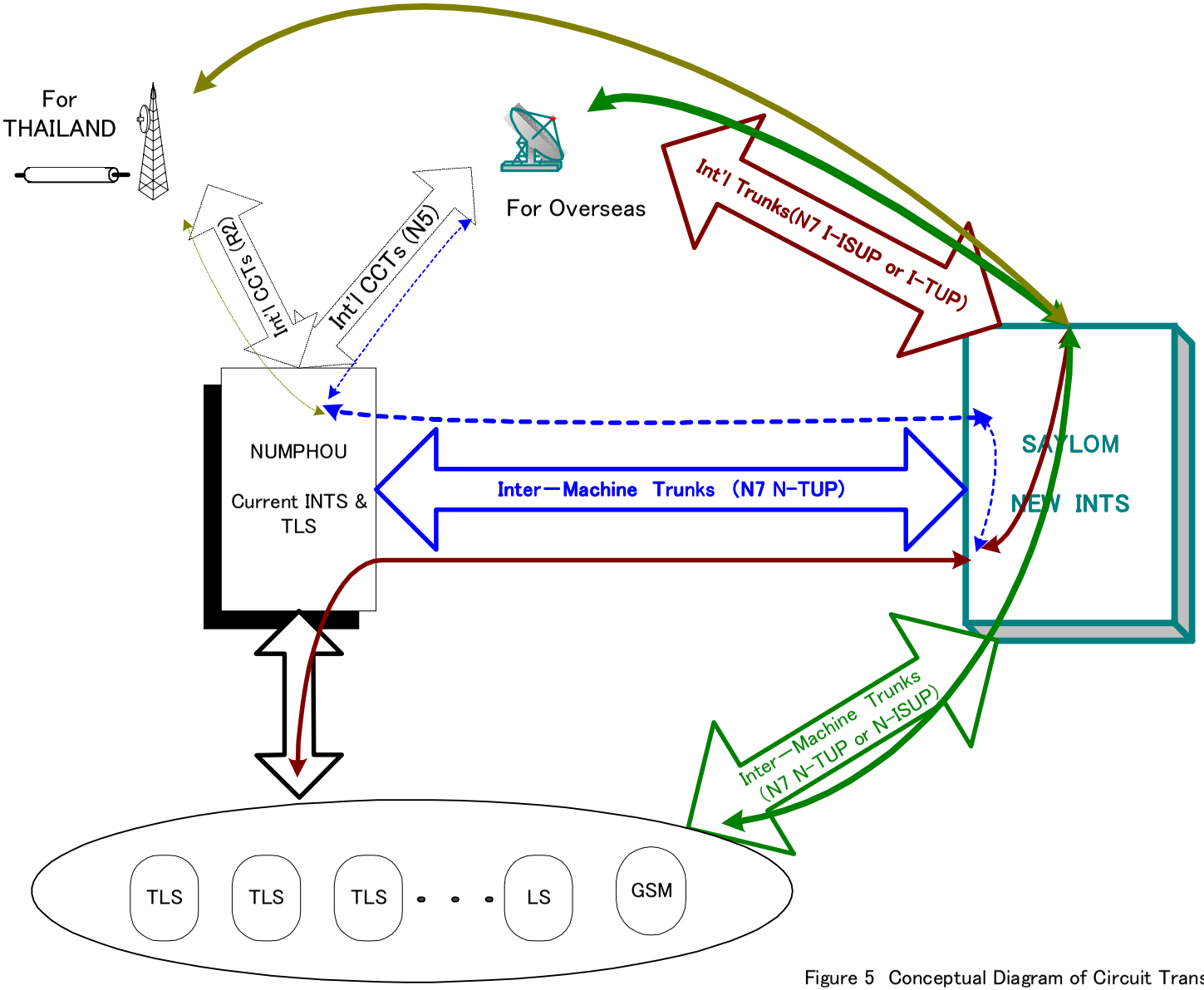
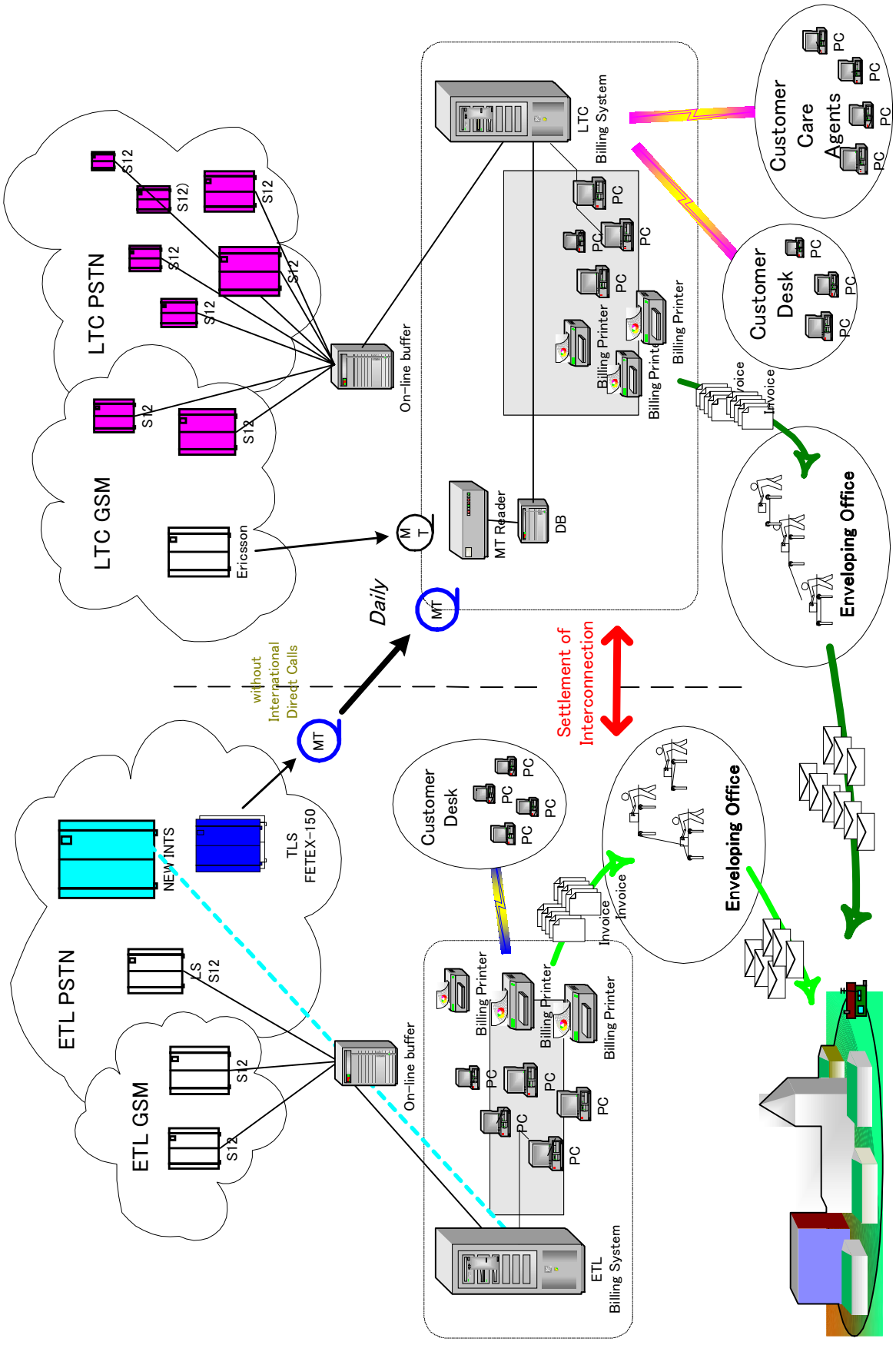


Figure 5 Conceptual Diagram of Circuit Transfer



Figuer 6 Conceptual Diagram of Billing

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Construction period

16 months including the period of detail design

(2) Employment of a consultant

After concluding the Exchange of Notes (E/N), ETL shall conclude a contract with a Japanese consultant to prepare the implementation design and tender documents, as well as to supervise the Project. The contract with the consultant must be made promptly after the conclusion of the E/N in order to shorten the implementation period.

The contents of the consultant's operations shall be as follows.

1) Formulation of technical specifications
2) Evaluation of proposal and support for contract negotiation
3) Confirmation of specifications before shipment
4) Implementation of supervision
5) Support of acceptance test

(3) Use of contractor

As the installation of the equipment for the Project needs careful process management and advanced technology, engineers of the manufacturer with good record of achievements in this field shall be used for the main portions of work.

However, for those operations that do not need special advanced technologies, the engineers of local communications equipment construction companies with the experience of installing the communications equipment as a subcontractor of a main contractor shall be used.

(4) Implementation System

1) Responsible organization: Ministry of Communication, Transport, Post, and Construction (MCTPC)

2) Implementing organization: Enterprise of Telecommunications Lao (ETL)

The departments in ETL that are in charge of the Project shall be as follows.

1) Formulation of plan, procurement, and construction: Planning Department

2) Operation and maintenance: Switching Department and Transmission Department

2-2-4-2 Implementation Conditions

After installation of the international telephone switching system and completion of the function test of the system, ETL shall transfer the international circuits from the existing international-domestic combined switching system (FETEX-150 switching system at the Numphou office) to the newly established international telephone switching system. After the establishment of the telephone switching system, ETL shall inform the following items to the telecommunications carrier of overseas countries and get agreement as soon as possible.

(1) An international telephone switching system shall be installed at the Saylom office. (To be notified)

(2) The international circuits terminal point and the international telephone switching point shall be moved from the Numphou office to the Saylom office. (Change of the names of the international circuits shall be agreed on.)

(3) A test of international transmission lines shall be implemented. (The test period and procedure shall be agreed on.)

(4) The international signaling system of the new international telephone switching system shall be changed from R2 and No.5, which are the old international signaling system to

International No.7, which is the current standard system. (To be agreed on).

2-2-4-3 Scope of Work

The scope of work pertaining to the equipment to be installed for the Project shall be entirely borne by the Japanese financial assistance including procurement and installation. The scope of work borne by the Lao side shall be to secure space necessary for installing the equipment, prepare the air-conditioning equipment, and prepare the commercial power source to supply the equipment.

2-2-4-4 Consultant Supervision

ETL should establish a Project team for the implementation of the long-term Project from the procurement contract, installation and inspection of equipment, to the start of operations in a professional manner, according to the plan for the smooth implementation of the Project.

During the installation of the equipment of the project, an engineer who has enough knowledge and experiences for and capability of coordination and supervision for the installation and adjustment of an international telephone switching system will be dispatched at the site to supervise the installation works for whole of the period. In addition, when the works are busy due to testing with other stations, etc., another engineer will be occasionally dispatched at the site.

Major services of supervision to be performed by the consultant are as follows:

1) Evaluation of documents and drawings made by manufacturer
2) Supervising the situation of procurement of equipment
3) Inspection of the shipping lists by the third party
4) Supervision of installation and adjustment of the equipment
5) Supervision of the international circuits transition
6) Supervision of work for interconnection between the new international telephone switching system and the existing billing system

7) Witness of acceptance test for the equipment

2-2-4-5 Procurement Plan

As only one company in Japan presently manufactures the international telephone switching system, the procurement method including third countries shall be applied to secure the price competition and lower the procurement price. The countries that can apply for procurement are OECD member countries including Japan, China, and Singapore.

With regard to the evaluation of manufacturers who tendered proposals, the manufacturer having the first right for contract negotiation shall be determined basically by considering compliance with technical specifications and the price.

2-2-4-6 Quality Control Plan

As the equipment shall be connected to the international telecommunication network and the existing domestic telecommunication network, it must strictly satisfy the ITU Recommendations, which is the international standard. The equipment shall be sufficiently confirmed in the acceptance test.

2-2-4-7 Implementation Schedule

In implementing the Project, expenses for equipment and its installation shall be shared between Japan and Lao PDR as follows. It is necessary for Lao PDR to perform the required items on time, on the basis of the implementation schedule.

(1) Items to be borne by Japan

1) Procurement and installation of an international telephone switching system and associated equipment

2) Technical instructions for the engineering works to be done by ETL to put the existing international-domestic combined switching system in a good condition for its transition to domestic use (soft-component services provided by the consultant)

(2) Items to be borne by Lao PDR

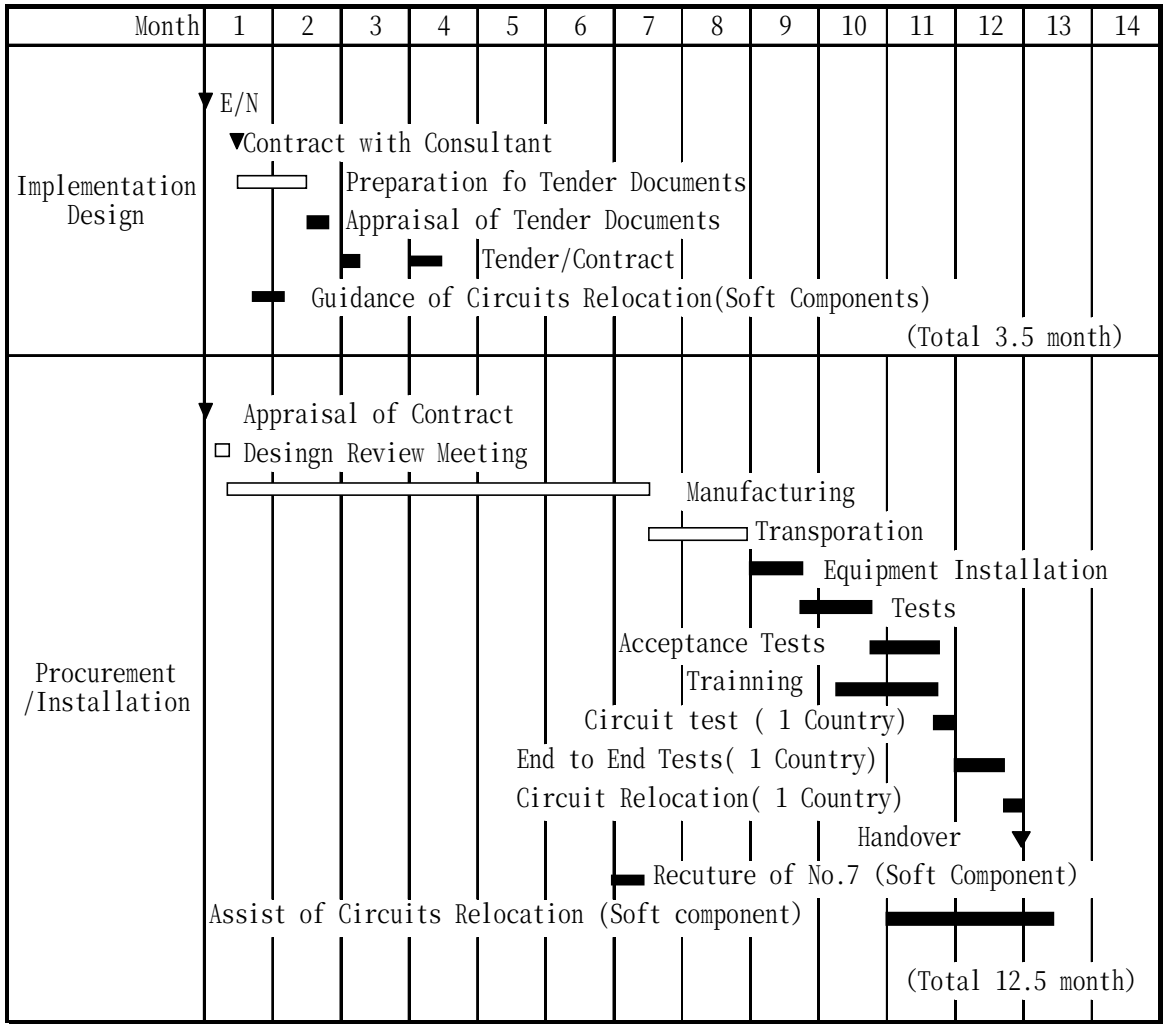
This part is described in clause 2-3 hereinafter.

(3) Completion of Implementation

When installation and testing of the equipment is completed and ETL has finished circuit transfer with the first foreign country and normal connection with the billing system has been confirmed, the implementation borne by Japan shall be deemed completed.

Implementation schedule of the Project is shown in Table 1.

Table 1 Implementation Schedule



2-3 Obligations of Recipient Country

Obligations to be performed by the recipient country are as follows:

(1) To provide space, air condition, power source with power cables and grounding for installation of a new international telephone switching system.

(2) To acquire international point code for Signaling System No.7.

(3) In connection with negotiations and agreement with foreign carries regarding the introduction of the new international telephone switching system, to implement the following businesses.

1) To inform all the telecommunication carriers of other countries that the new international telephone switching system will be installed at the Saylom office.

2) To inform all the telecommunication carriers of other countries that the terminating point of international circuit and the switching point of international telephone will be changed to the Saylom office from the Numphou office and obtain consent to the change of the name of international circuits.

3) To inform all the telecommunication carriers of other countries that international transmission channel test will be conducted, including the period and procedures for the test and obtain consent to the change of the name of international circuits.

4) To inform and obtain consent that the international signaling system of the new switching system will be changed to the current standard international No.7 signaling system from R2 and No. 5, which are old international signaling systems.

5) To reach an agreement on the period and procedures for the switching function test between

the switching system of another country and the new system in Lao PDR.

6) To reach an agreement between all the destination carriers of other countries regarding the period and procedures for the circuit change in connection with the change in switching system.

(4) To modify/expand the existing billing system to receive billing data from the new international telephone switching system.

(5) To provide necessary capacity of transmission lines between the Numphou office and Saylom ISC for implementing the Project.

(6) To transfer the international circuits from the existing international-domestic combined switching system to the new international telephone switching system and to establish inter-machine circuits between the new international telephone switching system and other domestic switching systems.

2-4 Project Operation Plan

2-4-1 Operation and Maintenance Plan

Operation and maintenance of the system will be implemented by the operation and maintenance department of the Saylom office. Operation and maintenance of new international telephone switching system at the Saylom office can be implemented by the engineers of the existing operation and maintenance department after they are trained.

Increase in business is expected in preparing international telephone bills based on the bill information output from the new international telephone switching system. It is necessary to

reinforce the sections for issuance of international telephone bills, inquiries from customers concerning bills and bill adjustment business and further the department of conducting bill profit sharing negotiation on international accounting rate with the telecommunication carriers of other countries.

Currently, ETL has the department of issuing bills to ETL's customers, which is accommodated in the subscriber switching system and cellular phone switching system. But the present organization is inadequate and the enhancement of the department is required, including increase in the number of personnel.

2-4-2 Personnel Plan

Personnel engaged in maintenance and operation of expanded equipment could be secured by assigning the personnel of the existing department, but the increase in personnel in the billing department, shown in Table 2 will be necessary due to the increase in business volume.

Table 2 Personnel of Billing Department

	Current personnel	Necessary personnel
Director of Billing Center	1	1
Bill handling personnel	4	6
Bill inquiry handling personnel	4	5
Increase in personnel		3

Planning Department: It is necessary to add two persons as personnel-in-charge of negotiation of international accounting rate and settlement with the telecommunication carriers of other countries.

Therefore, in connection with the implementation of the Project, an increase in total of 5

persons is expected.

2-4-3 Operation and Maintenance Cost

The annual cost for operation and maintenance of the system introduced by the Project is estimated as follows:

(1) Personnel fee

Additional personnel 5 persons x 500,000 Kip x 12 months = 30,000,000 Kip

(2) Electricity charge

10 KWh x 0.0513 US$/KWh x 24 h x 365 day = 4,494 US$

(3) Repair/consumables cost

This cost is needed from the second year onward after the Project completion.

28,000 US$

(4) Maintenance service cost

This cost is needed if ETL decides to receive a maintenance service provided by the supplier under a contract after the warranty period. The cost varies with the contents of the services. 150,000 US$ is estimated for this cost in this Project.

2-5 Other Relevant Issues

Soft-component is planned for the Project as follows:

(1) Necessity

As the large-scale transfer of international telephone switching system is the first experience

for ETL, and ETL has no experience in the operation of international No.7 signaling system before, the technology transfer in this field shall be done thoroughly. In addition, as the existing combined telephone switching system shall be improved to be used exclusively for domestic purpose, inspection of system stability, sorting of necessary data, and proper use of routing need highly professional knowledge, and the consultant engineer shall provide technical instruction.

(2) Direct effects

The soft-components shall make the transfer of international telephone switching system and international circuits perfect. Therefore it is extremely effective to complete the Project within the specified period. Furthermore, ETL shall be able to acquire the ability to smoothly implement the similar transfer in the future by itself.

With the proper implementation of the improvement of the existing combined switching system, the stable operation of the system in the future shall be secured.

(3) Project contents

1) Transfer of circuits

- Instruction for the acquisition of the international No.7 point code from ITU
- Instruction on the negotiation and implementation of the circuit transferal to the overseas telecommunications carriers
- Instruction on the designing of international and domestic telephone networks and routing plan
- Training on the No.7 signaling system and Integrated Services Digital Network (ISDN)
- Training on the transferal of international telephone switching functions and the technical matters on the transferal of international circuits

2) Improvement of the existing combined telephone switching system

- Technical instruction on the circuit establishment and routing procedure

- Technical instruction on the sorting of unnecessary data
- Technical instruction on the study for finding system trouble and the measures for making the system stable
- Technical instruction on the troubleshooting and proper allocation of spare parts

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

(1) Direct Effect

1) Continuous stable supply of the international telephone service

This Project will ensure to maintain the stable supply of the international telephone service in Lao PDR. When the Project is completed, demands for international telephone service by the national, the government and the businesses will be satisfied and convenience for the national will be kept and one of the social infrastructures for the development of administration and economy will be maintained.

2) Reduction of transit charges

When the Project is completed, the newly-installed international telephone switching system accommodated with the required international communication capability of international No.7 signaling system can establish direct circuits with foreign destination countries, avoiding unnecessary third-country transit of telephone calls and thus keeping away from undesirable expenditure of transit charges.

(2) In-direct Effect

1) Supply of foundation for promoting globalization

While Lao PDR has been strengthening relationships with the international community since its joining ASEAN, smooth operation of international communications will be an important basis for globalization in terms of administration, culture and economy.

2) Increase of trunk capacity for domestic interconnection on the existing combined switching system

The domestic trunk capacity of the existing combined switching system will be increased by 6 E1s because the international trunks can be diverted for domestic use after the

transition of international circuits and rearrangement of the data on the existing switching system are carried out when a new international telephone switching system is introduced. (Refer to Appendix-7)

3-2 Recommendations

For a success of the Project, following point are especially recommended with other obligations for the recipient country.

(1) Expansion or modification to the existing billing system

Coinciding the schedule for the Project, ETL shall expand or modify as necessary its existing billing system in order to process the billing data generated by the newly-installed international telephone switching system. These actions shall be taken in accordance with the schedule for the Project.

(2) Strengthening of organization and human resources

In order to practice international telephone service in earnest, ETL shall strengthen the organization which is responsible for negotiation with foreign operators and daily duties and secure a necessary number of personnel. At the same time, ETL shall increase the number of personnel of the billing center which deals with billing for domestic users and international settlement of telephone charges. About five persons for the additional jobs shall be employed.

Appendices

Appendices

1. Member List of the Study Team
2. Study Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions
5. Cost Estimation Borne by the Recipient Country
6. Trunk Capacity of International Telephone Switching System
7. Comparison of Trunk Capacity - Present and After Completion of the Project

Appendix-1

Member List of the Survey Team

1. Field Survey

Mr. Satoshi NAKANO	Team Leader	Deputy Director, Third Project Management Division, Grant Aid Management Department, JICA
Mr. Yusuke TSUMORI	Project Coordinator	Third Project Management Division, Grant Aid Management Department, JICA
Mr. Toru KIZUKA	Chief Consultant /Telecommunication Planner	KDDI Engineering and Consulting, Inc. (KEC)
Mr. Noriyuki WADA	Facilities Planner Ⅰ (Telecommunication System)	KDDI Engineering and Consulting, Inc. (KEC)
Mr. Yukio NEGISHI	Facilities Planner Ⅱ (High-speed Data Transmission)	Japan Telecommunications Engineering and Consulting Service (JTEC)
Mr. Kazunori OBA	Equipment Planner	KDDI Engineering and Consulting, Inc. (KEC)
Mr. Tsunemori YAMAGUCHI	Procurement, Construction Planner / Cost Estimator	KDDI Engineering and Consulting, Inc. (KEC)

2. Draft Final Report Explanation

Mr. Hiroko TANAKA	Team Leader	Grant Aid Division, Economic Cooperation Bureau Ministry of Foreign Affairs
Mr. Yusuke TSUMORI	Project Coordinator	Third Project Management Division, Grant Aid Management Department, JICA
Mr. Toru KIZUKA	Chief Consultant /Telecommunication Planner	KDDI Engineering and Consulting, Inc. (KEC)
Mr. Noriyuki WADA	Facilities Planner Ⅰ (Telecommunication System)	KDDI Engineering and Consulting, Inc. (KEC)
Mr. Kazunori OBA	Equipment Planner	KDDI Engineering and Consulting, Inc. (KEC)

Draft Final Report Explanation schedule

Date (2003)	Activities	Remarks
Feb. 17 (Mon)	Arrival in Vientiane, Courtesy Call to ETL, MCTPC and EOJ, Meeting with JICA Office	
Feb. 18 (Tue)	Draft Final Report Meeting with MCTPC & ETL	
Feb. 19 (Wed)	Meeting with MCTPC & ETL(M/D & Grant Aid Scheme)	
Feb. 20 (Thu)	Signing on M/D Report to EOJ & JICA Office	
Feb. 21 (Fri)	Site survey, Meeting with ETL	
Feb. 22 (Sat)	Site survey	
Feb. 23 (Sun)	Day off	
Feb. 24 (Mon)	Site survey, Meeting with ETL	
Feb. 25 (Tue)	Metting with ETL, Report to JICA Office	
Feb. 26 (Wed)	Consultant team leave Vientiane	

Survey schedule

Date (2002)	Activities
Nov. 4 (Mon)	Arrival in Vientiane, Meeting with JICA Office, Courtesy Call to EOJ, MCTPC & ETL
Nov. 5 (Tue)	Visited Nathom Earth Station, Namphou Station and Saylom Station Discussion with MCTPC & ETL
Nov. 6 (Wed)	Didcussion with MCTPC & ETL
Nov. 7 (Thu)	Didcussion with MCTPC & ETL
Nov. 8 (Fri)	Signing on M/D Report to EOJ & JICA Office
Nov. 9 (Sat)	Team Leader and Project Coordinator leave Vientiane Data analysis by Consultant
Nov. 10 (Sun)	Day off
Nov. 11 (Mon)	Site survey at Nathom Earth Station, Namphou Station and optical fiber cable route between Nathom Earth Station and Saylom Station
Nov. 12 (Tue)	Site survey at Nathom Earth Station, Namphou Station and optical fiber cable route between Nathom Earth Station and Saylom Station Meeting with Mr. Somlith, Deputy Director General, MCTPC & Mr. Hayashi, JICA Expert, MCTPC
Nov. 13 (Wed)	Site survey at Saylom Station, ETL Billing Center, CSC cable repeater station and Mobile-phone base station
Nov. 14 (Thu)	Site survey at Namphou Station, LTC Billing Center and optical fiber cable route between Nathom Earth Station and Saylom Station
Nov. 15 (Fri)	Site survey at Namphou Station and optical cable route between Nathom Earth Station and Saylom Station Collection of Price data Meeting with Mr. Vanpheng, Deputy Director General, LTC
Nov. 16 (Sat)	Data analysis by Consultant
Nov. 17 (Sun)	Day off
Nov. 18 (Mon)	Meeting with Mr.Phonpasit, STEA Survey at Namphou Station, Data analysis, Collection of price data
Nov. 19 (Tue)	Site survey for optical fiber cable route around Governmental offices Data analysis, Collection of price data
Nov. 20 (Wed)	Meeting with Mr. Houmphanh, Director General, LTC Site survey for optical fiber cable route between Namphou Station and the Ministry of Public Health Data analysis, Collection of price data
Nov. 21 (Thu)	Discussion with Mr. Syyang, Director, ETL Site survey for optical fiber cable route between Namphou Station and the State Planning Committee (SPC) Visit two ISPs, Data analysis, Collection of price data
Nov. 22 (Fri)	Meeting with Mr. Padapphet, Director General, ETL Site survey for optical fiber cable route around Governmental offices, Data analysis
Nov. 23 (Sat)	Data analysis by Consultant
Nov. 24 (Sun)	Day off
Nov. 25 (Mon)	Meeting with Mr. Padapphet, Director General, ETL Site survey for optical fiber cable route between Namphou Station and the State Planning Committee (SPC), Data analysis
Nov. 26 (Tue)	Meeting with Mr. Palami, Director General and Mr. Snith, Director of Telecommunication Division, MCTPC Site survey for optical fiber cable route between the Ministry of Justice and the Ministry of Public Health Observation of MCTPC's LAN Network, Collection of price data, Data analysis
Nov. 27 (Wed)	Site survey for optical fiber cable route between the Ministry of Justice and the Ministry of Public Health Data analysis, Collection of price data
Nov. 28 (Thu)	Site survey at Saylom Station and Namphou Station Preparation of Interim Report, Collection of price data
Nov. 29 (Fri)	Meetin with Mr. Khamlouat, Vice Minister, MCTPC Presentation of Interim Report to counterpart of ETL & MCTPC personnel, Collection of price data
Nov. 30 (Sat)	Site survey for optical fiber cable route between Airport and NOVOTEL area Data analysis by Consultant
Dec. 1 (Sun)	Day off
Dec. 2 (Mon)	Preparation of Memorandum and Consultant's Report Data analysis by Consultant
Dec. 3 (Tue)	Discussion with MCTPC & ETL
Dec. 4 (Wed)	Final Meeting with MCTPC & ETL, Signing on Memoramdum of Survey
Dec. 5 (Thu)	Additional Survey & Data analysis
Dec. 6 (Fri)	Report to JICA Office & EOJ
Dec. 7 (Sat)	Consultant team leave Vientiane

List of Parties Concerned in the Recipient Country

1. Field Survey

Embassy of Japan

Mr. Itsuo Hashimoto, Ambassador

Mr. Kazunori Kawada, First Secretary

JICA Laos Office

Mr. Hidetaka Nishiwaki, Resident Representative

Mr. Shuichi Ikeda, Deputy Resident Representative

Mr. Masatoshi Kaimasu

JICA Expert

Mr. Hiroyasu Hayashi, Advisor of MCTPC

Mr. Tatsuhiko Adachi, Advisor of ETL

Mr. Satoshi Wada, National University of Laos

Ministry of Communication, Transport, Post and Construction (MCTPC)

Mr. Khamlouat SIDLAKONE, Vice Minister

Mr. Khanngeun KHAMVONGSA,

Deputy Permanent Secretary, International Relations & Foreign Investment

Mr. Palami PHOMMATHANSY,

Director General, Department of Posts & Telecommunications

Mr. Somlith PHOUTHONESY,

Deputy Director General, Department of Posts & Telecommunications

Mr. Snith XAPHAKDY, Director, Telecommunication Division

Science, Technology and Environment Agency (STEA)

Mr. Phonpasit PHISSAMAY, Director of Information Technology Center

Enterprise of Telecommunications Lao (ETL)

Mr. Padapphet SAYAKHOT, Director General

Mr. Khammouane XOMSIHAPANYA, Deputy Director General

Mr. Syyang CHERTOI, Director, Transmission Division

Mr. Souphalak MANGNOMEK,

Chief of Technical Unit, Planning Section, Planning & Development Division

Mr. Khamla SYAPHONE, Mobile Communications Manager, Transmission Division

Mr. Anousone SOUVANNAVONG, Deputy Director of PSTN

Mr. Sengsonexay KEOVANTHINE, Switching Manager

Mr. Khammone SACKDA, Manager, Nathom Satellite Earth Station

Mr. Seugdalath KATTIGNASACK, Chief of CSC Cable System

Mr. Hom VANMANY, Manager of CSC Cable System

Lao Telecommunications (LTC)

Mr. Houmphanh INTHARATH, Director General

Mr. Vanpheng SAYAKONE, Deputy Director General

Ms. Somchit LEUANGVANSAY, Manager of Collection & International Relation Department

Mr. Itthipon WORAWONG, Chief of Billing Center

Mr. Southsavath VANTHANOUVONG, Chief of Lao Internet & M-Phone Center

2. Draft final Report explanation

Embassy of Japan

Mr. Itsuo Hashimoto, Ambassador

Mr. Kazunori Kawada, First Secretary

JICA Laos Office

Mr. Hidetaka Nishiwaki, Resident Representative

Mr. Shuichi Ikeda, Deputy Resident Representative

Mr. Masatoshi Kaimasu

JICA Expert

Mr. Hiroyasu Hayashi, Advisor of MCTPC

Mr. Tatsuhiko Adachi, Advisor of ETL

Ministry of Communication, Transport, Post and Construction (MCTPC)

Mr. Bouathong VONLOKHAM, Minister

Mr. Math SOUNMALA, Director General, General Office

Mr. Palami PHOMMATHANSY, Director General, Department of Posts & Telecommunications

Committee for Planning and Cooperation

Dr. Bountheunang MOUNLASY, Director General, Department of International Cooperation (DIC)

Enterprise of Telecommunications Lao (ETL)

Mr. Padapphet SAYAKHOT, Director General

Mr. Khammouane XOMSIHAPANYA, Deputy Director General

Mr. Anousone SOUVANNAVONG, Deputy Director of PSTN

Mr. Sengsonexay KEOVANTHINE, Switching Manager

Mr. Hom VANMANY, Manager of CSC Cable System

Mr. Vanthong SOSAMPHANH, Director of Marketing

Mr. Hongsavanh VONGKHAMSAO, Deputy Director of Transmission and Mobile

Mr. Vathana Chief of IT

Mr. Chitachone MOUNIVONG, Workshop Manager

Mr. Vixay KHENSACKMEUANG, Billing Manager

Minutes of Discussions
on the Basic Design Study
on the Project for Improvement of IT Facilities in Vientiane City
in the Lao People's Democratic Republic

In response to the request from the Government of the Lao People's Democratic Republic (hereinafter referred to as "the Lao P.D.R."), the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of IT Facilities in Vientiane City (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Lao P.D.R. the Basic Design Study Team (hereinafter referred to as "the Team"), which was headed by Mr. Satoshi Nakano, a Deputy Director of the Third Project Management Division, the Grant Aid Management Department, JICA, and is scheduled to stay in the country from November 4 to December 7, 2002.

The Team held discussions with the officials concerned of the Government of the Lao P.D.R. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Vientiane, November 8, 2002

Satoshi Nakano
Leader
Basic Design Study Team
Japan International Cooperation Agency

Palami Phommathansy
Director General
Ministry of Communication, Transport,
Post and Construction
Lao People's Democratic Republic

Padapphet Sayakhot
Director General
Enterprise of Telecommunications Lao
Lao People's Democratic Republic

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the telecommunications environment in Vientiane City by improving IT facilities.

2. Project Sites

The sites of the Project are shown in Annex-1.

3. Responsible and Implementing Organizations

3-1 Responsible Ministry: the Ministry of Communication, Transport, Posts and Construction (MCTPC)

3-2 Implementing Agency: the Enterprise of Telecommunications Lao (ETL)

The organization chart of the Implementing Agency is shown in Annex-2.

4. Items Requested by the Government of the Lao P.D.R.

After discussions with the Team, the following items described were finally requested by the Lao side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval. However, the final items and the scale of the Project shall be decided after further analysis in Japan.

(1) The establishment of new international gateway switching system,

(2) The rearrangement of existing national trunk exchange,

(3) The expansion of the satellite communication system and the transmission capacity from Earth station to the new international gateway switching system,

(4) The establishment of optical fiber digital transmission system,

(5) The establishment of main Internet service system.

5. Japan's Grand Aid Scheme

5-1 The Lao side understands the Japan's Grant Aid scheme explained by the Team as described in Annex-3.

5-2 The Lao side will take necessary measures, as described in Annex-4, for smooth implementation of the Project as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

6-1 The consultants will proceed to further studies in the Lao P.D.R. by December 7, 2002.

6-2 JICA will prepare the draft final report in English and dispatch a mission to the Lao P.D.R. in order to explain its contents around February, 2003.

6-3 In case that the contents of the draft final report is accepted in principle by the Government of the Lao P.D.R., JICA will complete the final report and send it to the Government of the Lao P.D.R. by the end of April, 2003.

7. Other Relevant Issues

7-1 The Team explained to the Lao side that the Basic Design of the Project be carried out based on the following principle:

The volume of the equipment procured under the Grant Aid shall be studied based on the shortage of the capacity in the current demand in Vientiane city, not in the future demand, as well as on the implementation capacity of the ETL, such as budgeting, human resources of technicians and management capability.

The Lao side understands the above-mentioned principle.

7-2 The ETL will not be privatized in the foreseeable future.

7-3 Concerning the establishment of new international gateway switching system, the Team explained to the Lao side that the specifications of the equipment should be designed by the consultant to allow at least several manufacturers or more to participate in the tender so that the competitiveness of the tender would be secured and increased. Since there is only one manufacturer of the equipment in Japan, the Lao side shall also consider the procurement of the equipment from third countries based on the recommendation by the consultant according to the Guidelines of Japan's Grant Aid Scheme. The decision on the procurement from third countries will be made after the Government of Japan approves the request from the Lao side. The Lao side agreed to the above-mentioned concept and procedures.

7-4 Concerning the establishment of new international gateway switching system, it shall be one of the Lao side's major undertakings to negotiate with foreign

telecommunications carriers on transferring international circuits to the equipment.

7-5 Concerning the establishment of new international gateway switching system, the ETL shall, with the advice of the consultant, carry out the works of transferring the circuits from the existing switch in Numphou to the new international gateway switching system to be installed in Saylom.

7-6 Concerning the rearrangement of existing national trunk exchange, the Lao side requested to the Team to include the consultant services, what we call "the soft-component," as one of the components of the Grant Aid. The Team replied to the Lao side that they would consider it positively if the manufacturer of the equipment agreed to cooperate to dispatch their engineer to the Lao P.D.R. for the supervision of the rearrangement work by the Lao side.

7-7 Concerning the expansion of the satellite communication system, the Team explained to the Lao side that the Japanese side considered it very cautiously whether it should be included as the component of the Project, because the equipment could only be procured from the same manufacturer as those of the already installed equipment, which means no competitiveness of the tender.

7-8 Concerning the establishment of optical fiber digital transmission system, the Team explained to the Lao side that the Japanese side considered it very cautiously whether it should be included as the component of the Project, because it is intended for a public business after the ETL becomes an Internet Service Provider.

7-9 Concerning the establishment of main Internet service system, the Team explained to the Lao side that the Japanese side considered it very cautiously whether it should be included as the component of the Project, because some sort of the equipment itself would soon become obsolete. The Lao side explained to the Team that the equipment procured under the Grant Aid would be used for long years like the existing equipment in the ETL.

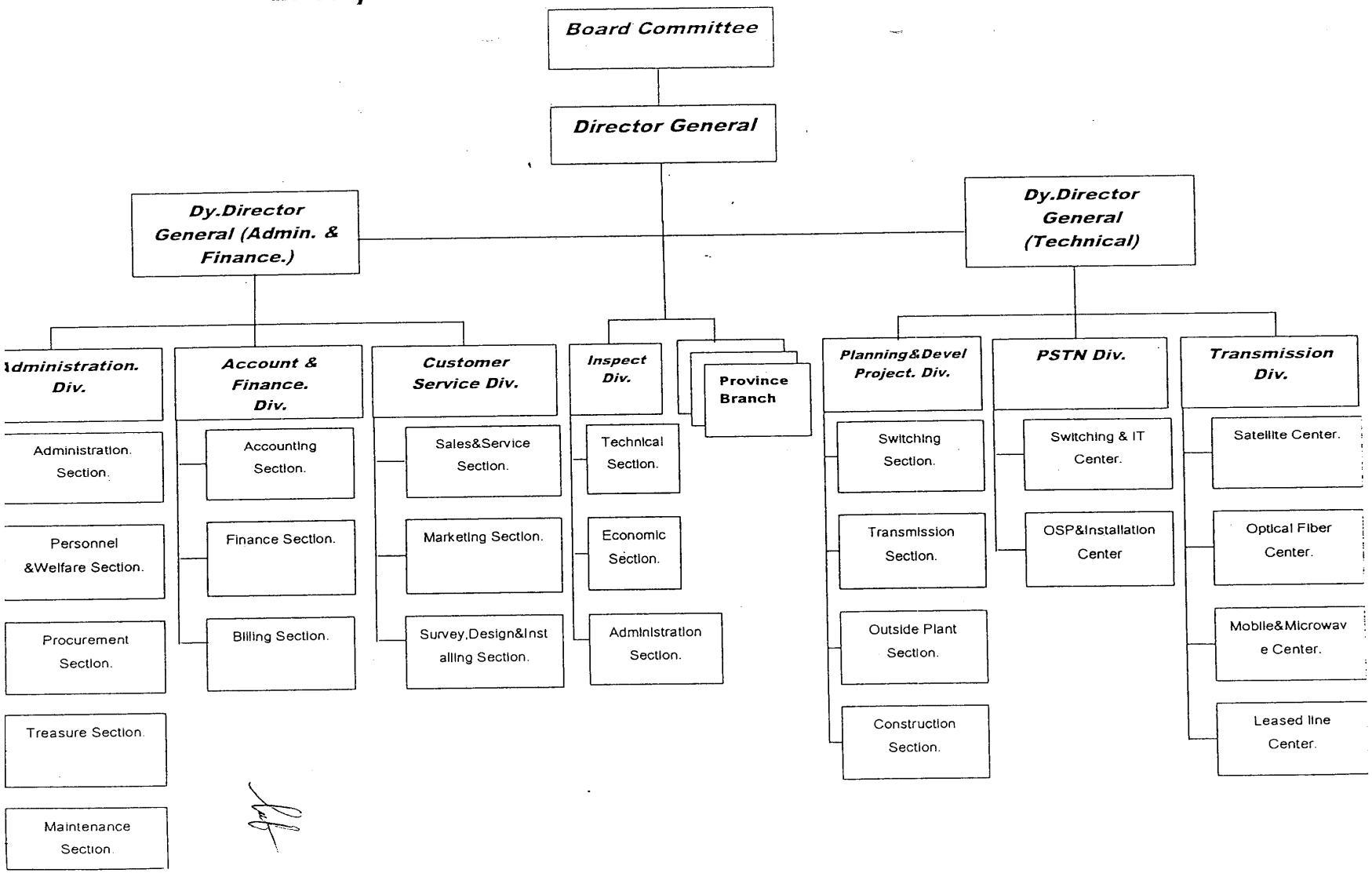
7-10 It shall be one of the Lao side's major undertakings to secure the space for the installation of the equipment procured under the Grant Aid, with the adequate conditions, such as the supply of electric power, air conditioning, earthing and others.

7-11 The Lao side shall secure enough budget and personnel necessary for the proper and effective operation and maintenance of the equipment procured under the Grant Aid after the hand-over of the equipment to the Lao side.

7-12 For the sake of the technology transfer on the sustainable operation and maintenance of the equipment procured under the Grant Aid, the Lao side pointed out the need for technical training of counterpart personnel in Japan. The Lao side also understands that another official request on technical cooperation shall be submitted to the JICA Laos Office.

Project Sites

Enterprise of Telecommunications Lao (ETL)



Annex - 2

Minutes of Discussions
on the Basic Design Study
on the Project for Improvement of International Telephone Switching System
in the Lao People's Democratic Republic
(Explanation of the Draft Report)

In November 2002, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of IT Facilities in Vientiane City (hereinafter referred to as "the Project") to the Lao People's Democratic Republic (hereinafter referred to as "the Lao P.D.R."), and through discussions, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult with the officials concerned of the Government of the Lao P.D.R. on the components of the draft report, JICA sent to the Lao P.D.R. the Basic Design Explanation Team (hereinafter referred to as "the Team"), which was headed by Ms. Noriko Tanaka, an Official of the Grant Aid Division Economic Cooperation Bureau, the Ministry of Foreign Affairs of Japan, from February 16 to 22, 2003.

As a result of discussions, both sides confirmed the main items described in the attached sheets.

Vientiane, February 20, 2003

Noriko Tanaka
Leader
Basic Design Explanation Team
Ministry of Foreign Affairs
Japan

Palami Phommathansy
Director General
Department of Posts and Telecommunications
Ministry of Communication, Transport
Post and Construction
Lao People's Democratic Republic

Padapphet Sayakhot
Director General
Enterprise of Telecommunications Lao
Lao People's Democratic Republic

ATTACHMENT

1. Components of the Draft Report

The Government of the Lao P.D.R. agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid Scheme

The Lao side understands the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of the Lao P.D.R. as explained by the Team and described in ANNEX-3 and ANNEX-4 of the Minutes of Discussions signed by both sides on November 8, 2002.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of the Lao P.D.R. by April, 2003.

4. Other Relevant Issues

4-1 The Project's name " The Project for Improvement of IT Facilities in Vientiane City" shall be changed to "The Project for Improvement of International Telephone Switching System."

4-2 Since there is only one manufacturer of the equipment for the new international gateway switching system in Japan, the Lao side shall also consider the procurement of the equipment from third countries based on the recommendation by the consultant according to the Guidelines of Japan's Grant Aid. The decision on the procurement from third countries will be made after the Government of Japan approves the request from the Lao side. The Lao side agreed to the above-mentioned concept and procedures.

4-3 The Team explained the system of maintenance services by the manufacturer after the warranty period described in ANNEX-1.

4-4 ETL is the sole operator providing international telephone services and international settlement of telephone charges on the basis of bilateral accounting rate.

4-5 The technical assistance by the Consultant called "the soft-component" described below shall include as one of the components of the Grant Aid.

(1) Transfer of circuit:

- Instruction for the acquisition of the international No.7 point code from ITU,
- Instruction on the negotiation and implementation of the circuit transferal to the overseas telecommunications carriers,
- Instruction on the designing of international and domestic telephone networks and routing plan,
- Training on the No.7 signaling system and Integrated Services Digital Network (ISDN),
- Training on the transferal of international telephone switching functions and the technical matters on the transferal of international circuits.

(2) Improvement of the existing combined telephone switching system:

- Technical instruction on the circuit establishment and routing procedure,
- Technical instruction on the sorting of unnecessary data,
- Technical instruction on the study for finding system trouble and the measures for making the system stable,
- Technical instruction on the troubleshooting and proper allocation of spare parts.

4-6 The Lao side shall implement necessary measures described below in a timely manner which the Team explained according to the schedule of the Project:

(1) Secure the space for the installation of the equipment procured under the Grant Aid, with the adequate conditions, such as the supply of electric power, power cable, air conditioning and earthing.

(2) Modify and expand the existing billing system to receive billing data from the new international telephone switching system,

(3) Provide necessary capacity of transmission lines between the Numphou office and Saylom ISC for implementing the project,

(4) Transfer the international circuits from the existing international and domestic combined switching system to the new international telephone switching system and to establish inter-machine circuits between the new international telephone switching system and other domestic switching system,

(5) Acquire the International Point Code for changing the signaling system to No.7,

(6) Make a plan on the transferring international circuits to the new international telephone switching system including No.7 signaling system, negotiate and reach an agreement with foreign telecommunications carriers on the plan and its implementation,

(7) Secure the necessary number of personnel for the billing center and international settlement of telephone charges.

4-7 The Lao side shall secure enough budget and personnel necessary for the proper and effective operation and maintenance of the equipment procured under the Grant Aid after the hand-over of the equipment to the Lao side.

4-8 For the sake of the technology transfer on the sustainable operation and maintenance of the equipment procured under the Grant Aid, the Lao side pointed out the need for technical training of counterpart personnel in Japan. The Lao side also understands that other official requests on technical cooperation shall be submitted to the JICA Laos Office.

4-9 The Lao side will cooperate for the publicity of this project supported by Japan.

Maintenance Services for the Purchased Equipment

The supplier for the equipment or system usually offers to provide several packages of "maintenance service" for the purchased equipment or system. The packages normally consist of several leveled services based on their response time, contents and extent of service, etc., in inquiries, trouble shooting, repairing, etc.

ETL is able to negotiate and contract with the supplier regarding the service contents, terms and conditions and prices by their own budget.

Besides the maintenance services, there is also "spot support service" in an issue-by-issue basis. This service, however, has some risks such as slow response time due to lower priority because of no contract concluded in advance.

Appendix-5

Cost Estimation borne by the Recipient Country

Item	Estimated Cost
Modification/Expansion of the existing billing system for receiving billing data from the International Telephone Switching System to be installed in Saylom ISC	US$700,000

Trunk Capacity of International Telephone Switching System

In building a new international telephone switching system, to keep route-diversities and to reduce load on the existing international switching system, individual circuits for inter-connections will be implemented between the new switching system and other existing switching systems for international calls.

Consequently, additional domestic capacity should be estimated for the individual (critical) inter-connections and results of rounding up capacities in E1 calculations, and also for new inter-connections with new carriers.

On the other hand, the growth rate of international call-minuets in 2001 was 8 % against the last year (i.e. year 2000) and the growth rate seems to be getting dull year by year. Having an assumption of yearly growth rates for the next 3 years until the project to be completed in 2005, are as 7%, 6%, 5% respectively, the growth rate in total would be as follows.

1.07 x 1.06 x 1.05 ＝ 1.1909 => 19 %

Then, capacity for the domestic inter-connections on the new switch would be 30E1s in total referring a calculation in the table below.

	Y2002 Current (in E1)	Y2002-2005 Growth-19% (in E1)	Y2005 Plan (E1)
THAKHEK(F150)	0.5	0.6	1.0
KHANTHABOULY(F150)	0.5	0.6	1.0
PAKXE(F150)	0.6	0.7	1.0
XAYSETHA(F150)	3.0	3.6	4.0
SISATTANAK(F150)	3.0	3.6	4.0
SAYLOM(LS S12)	1.5	1.8	2.0
NUMPHOU(F150)	5.5	6.5	7.0
LTC NUMPHOU(S12)	3.0	3.6	4.0
ETL (GSM)	1.0	1.2	2.0
LTC (GSM)	1.3	1.5	2.0
New Carrier 1 (LAT)	N/A		1.0
New Carrier 2 (Millicom)	N/A		1.0
	19.9	**23.7**	**30.0**

Regarding capacity for international portion, multiplying the current 16 E1s by the growth rate of international calls until 2005, the product would be as below.

16 E1 x 1.19 20 E1

Additionally, a capacity of 5E1s should be added for the following purposes.

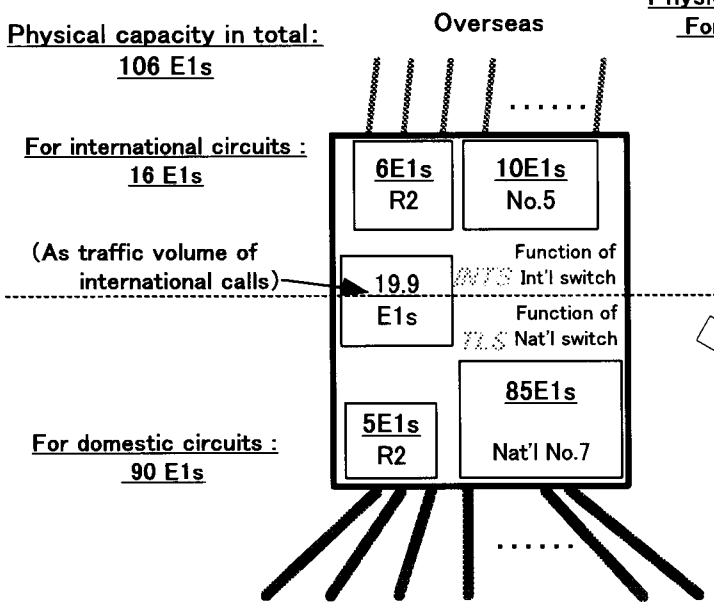
- For circuit testing: 3E1s
- For new international destinations under consideration: 2E1s

As a result, the total capacity of both international and domestic trunks is estimated as follows.

30 E1＋20 E1＋5 E1＝ 55 E1

AT PRESENT

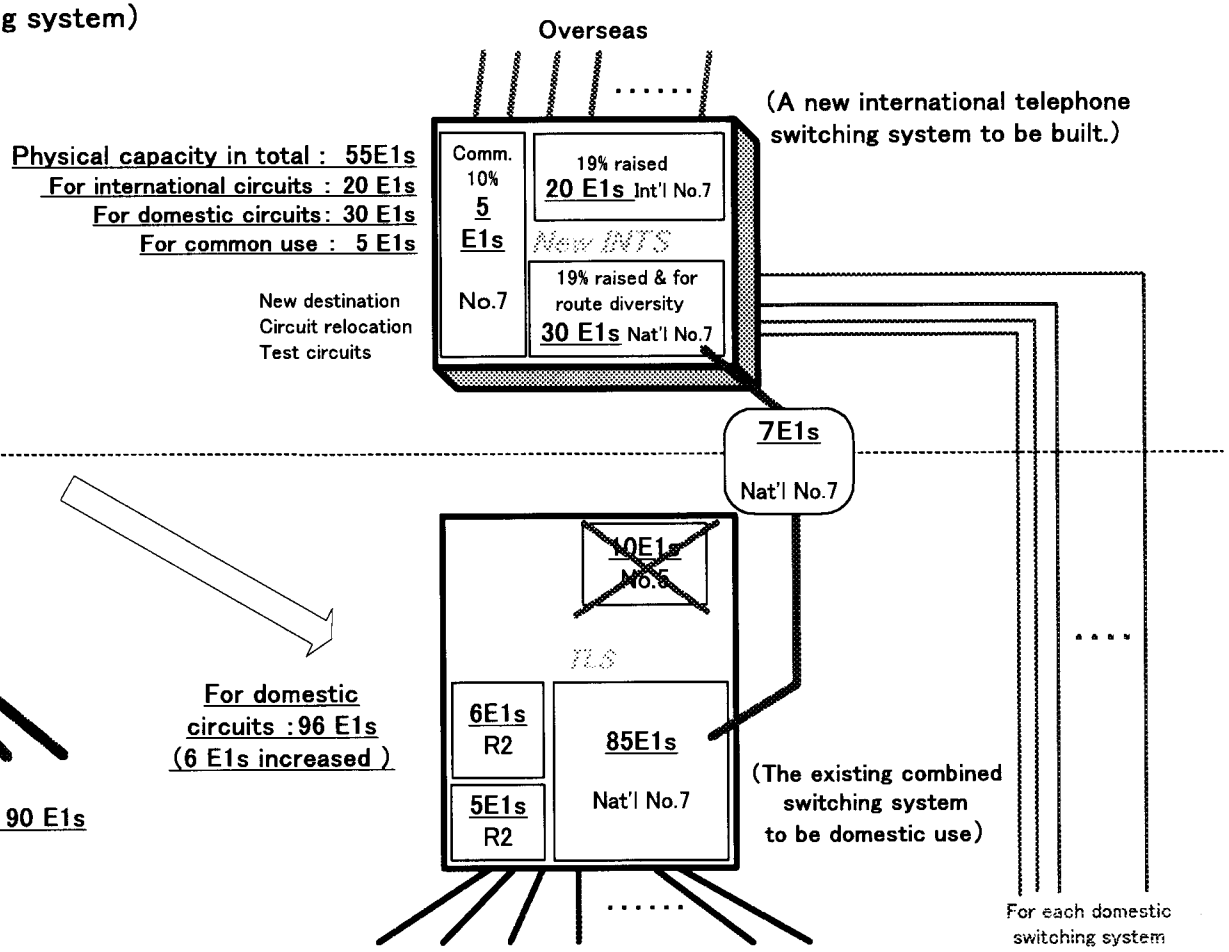
(With a combined INTS/TLS switching system)



Utilization : For domestic 5 + 85= 90 E1s

Spare capacity : 90 − 90 = 0 E1

IN FUTURE with A NEW INTS



Utilization : For domestic 5 + 85 + 7 − 19.9 = 77.1 E1s

Spare capacity : 6 + 19.9 − 7 = 18.9 E1s
(As added spare capacity on the existing combined switching system)

Comparison of Trunk Capacity - Present and After Completion of the Project