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BASIC DESIGN STUDY REPORT
ON
THE ESTABLISHMENT PROJECT
FOR
EDUCATION AND PUBLIC SERVICES BROADCASTING STATION CHANNEL 11
IN
THE KINGDOM OF THAILAND

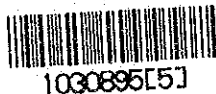
DECEMBER 1986

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

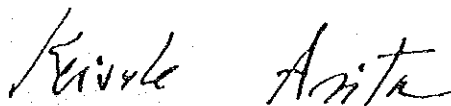
In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to conduct a basic design study on the Project for Establishing the Education and Public Services Broadcasting Station Channel 11 and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Thailand a study team headed by Mr. Tomofumi YASUNARI, Deputy Director, Engineering Division, Broadcasts Administration Bureau, Ministry of Posts and Telecommunications, from July 22 to August 9, 1986.

The team had discussions on the Project with the officials concerned of the Government of Thailand and conducted a field survey. After the team returned to Japan, further studies were made, a draft report was prepared and a mission to explain and discuss it was dispatched to Thailand. As a result, the present report has been prepared.

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

I wish to express my deep appreciation to the officials concerned of the Government of the Kingdom of Thailand for their close cooperation extended to the team.

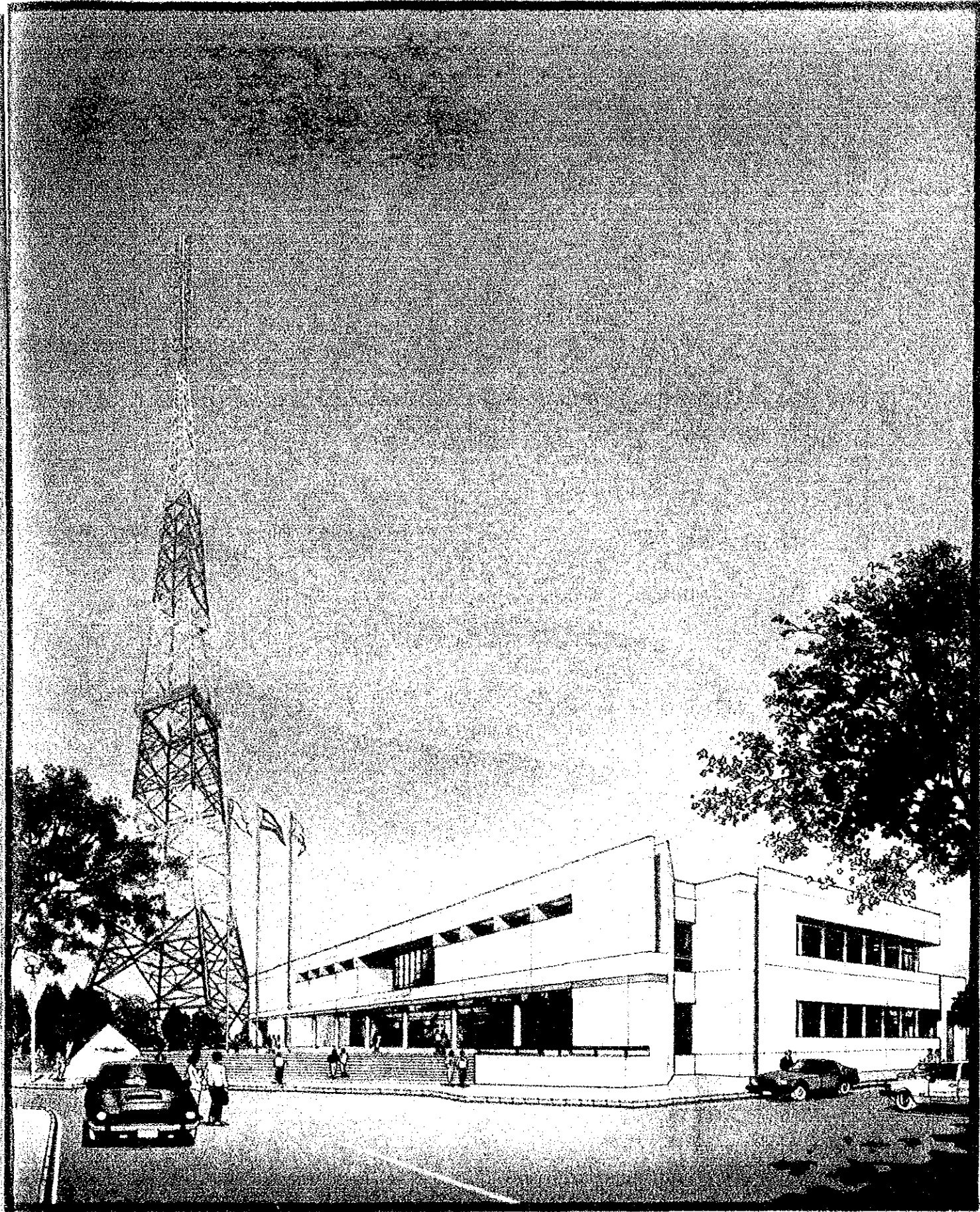
December, 1986.



Keisuke Arita

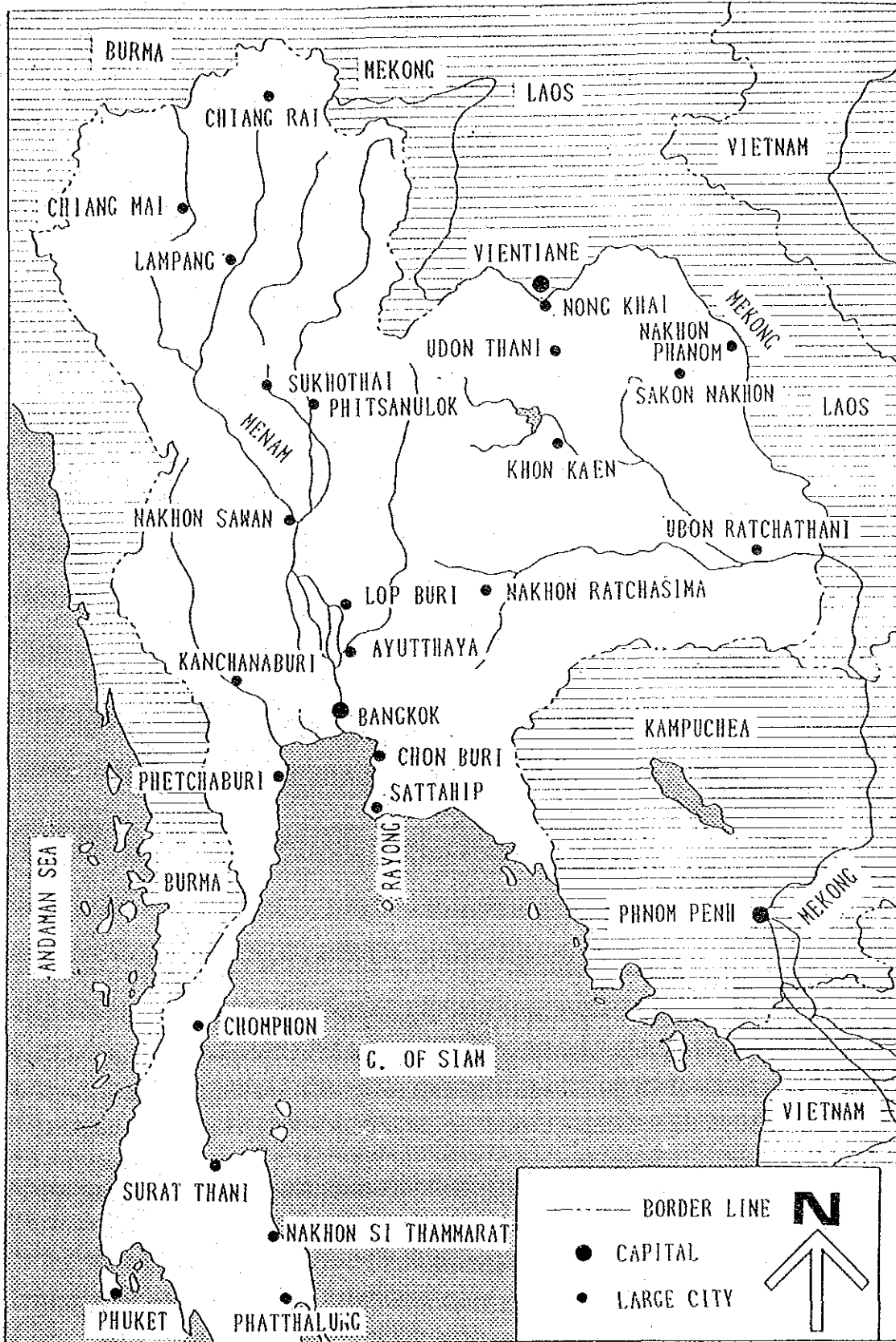
President

Japan International Cooperation Agency



EDUCATION AND PUBLIC SERVICES BROADCASTING STATION CHANNEL 11

THAILAND MAP



SUMMARY

SUMMARY

The history of television broadcasting services in the Kingdom of Thailand dates back to 1955 when the first television broadcasting was done by Thai Television Co., Ltd. Thereafter the activities of Thai Television Co. were taken over and expanded by 5 organizations, namely, Thai Mass Communications Organization (CH-9), Bangkok Entertainment Company (CH-3), Army Television (CH-5), Bangkok Radio and Television Company (CH-7) and state-operated Television of Thailand.

The Government of the Kingdom of Thailand (hereinafter referred to as the Government of Thailand) nominated the Public Relations Department (PRD) of the Office of the Prime Minister as an executing organization of Television of Thailand and has been endeavoring to expand the scope of national television broadcasting services. In an attempt to establish a nationwide television network, the Government of Thailand requested the Government of Japan to conduct surveys on the "Nationwide Television Broadcasting Network Construction Plan" and the Government of Japan conducted surveys on this plan in 1966.

One of the roles of Television of Thailand in the plan was to expand television broadcasting services among the nation's rural areas. The government's efforts along this line have resulted in the establishment of 4 regional centers, 9 local stations and about 30 relay stations which are now in operation obtaining considerable results. However, Thailand still does not have a key station in the Bangkok metropolitan area. This means that Thailand does not have a nationwide television network. Thus Television of Thailand is unable to produce programs on its own or to broadcast local stations' programs on a nationwide basis. This has been a great obstacle to the progress of the above-mentioned "Nationwide Television Broadcasting Network Construction Plan."

Another problem is that Television of Thailand is still incapable of providing Sukhothai Thammathirat Open University (STOU) and other educational program producing organizations with nationwide broadcasting time. These educational program producing organizations are currently borrowing air time from other broadcasting stations which operate on a

commercial basis. But this arrangement is very expensive and in recent years it has become increasingly difficult to borrow air time from these stations.

In the light of these circumstances, the Government of Thailand decided in a Cabinet meeting held in 1985 on a project to establish a key station for nationwide television broadcasting services which will place the utmost emphasis on public and educational television broadcasting, and set up CH-11, an experimental station. After obtaining channel rights for CH-11, the Government of Thailand asked the Government of Japan for a grant aid for constructing full-scale station facilities for CH-11.

In response to this request, the Government of Japan dispatched a preliminary survey team to Thailand through the Japan International Cooperation Agency (JICA) from March 31 to April 11 in 1986, and the team confirmed the necessity and contents of the project. After that the Government of Japan dispatched a basic design study team to Thailand from July 22 to August 9 of the same year.

In the basic design study, the contents of the request of the Government of Thailand, the propriety of the project in terms of the grant aid program and the scope of the grant aid were examined, and at the same time the field survey of the project site and the infrastructure in and around the site was conducted.

The objectives and contents of this project are as shown below.

- Objectives:
- (1) To establish a public and educational television broadcasting organization in the Bangkok metropolitan area.
 - (2) To set up a key station indispensable for a nationwide public and educational television broadcasting network.
 - (3) To establish a system which enables Television of Thailand to produce educational and public broadcasting programs on its own.

- (4) To promote the exchange of programs with foreign television broadcasting organizations.

The Public Relations Department (PRD) of the Prime Minister's Office is in charge of implementing this project. PRD is currently operating 4 regional centers, 9 local stations and about 30 relay stations, as well as the CH-11 experimental station. Also PRD will be in charge of the full-scale CH-11 station facilities to be constructed through this project.

The project site is located about 80 m north of the existing CH-11 experimental station. Its land area is about 17,900 m².

The outline of the prospective facilities and equipment is as follows.

- (1) Station building: 2-story building with a total floor area of 2,797 m²
- (2) Transmitting equipment: Two 20 kw transmitters, one steel tower 180 meters in height
- (3) Program sending equipment: Microlink equipment linked to Telephone Organization of Thailand (TOT) which has a nationwide network
- (4) Program production equipment: News studio, master control room, record reproduction equipment, editing equipment, dubbing studio, production studio, OB Van (Outside Broadcasting Van)

The construction cost to be borne by the Thai side is estimated to be 488,000 Bahts.

It will take 4 months for this project to proceed from detail designing to tendering and about 12 months for the construction work to be completed.

This project is going to be implemented along with the policy of the Government of Thailand to establish a public educational broadcasting

system, and at its completion Thailand's national television broadcasting system will become quite different from the other commercial television broadcasting organizations in terms of objectives, management system and program content. Also, at its completion Thailand's national television broadcasting network will become nationwide in scope and will be able to provide the nation's educational program producing organizations with the necessary broadcasting time, thereby bringing about dramatic improvement in the activities of the public and educational television broadcasting services.

Furthermore, the Government of Thailand has requested Japan's cultural grant aid to provide TV programs and technical cooperation including the dispatch of Japanese experts to Thailand and the training of their Thai counterparts in Japan. Technical cooperation is particularly effective because it will help develop the human resources necessary for the project and thus enhance the efficient implementation of the project. In this context, Japan's grant aid for this project is of great significance and will contribute to furthering the friendly relationship between Japan and Thailand.

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CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

Based on the "Nationwide Television Broadcasting Network Construction Plan" formulated in 1966, the Government of Thailand has been making a continuous effort to expand television broadcasting services among the nation's provincial areas. This effort has resulted in establishing 4 regional centers, 9 local broadcasting stations and 30 relay stations. Also, this effort has proved successful, providing public services through television broadcasting to rural areas which had been far behind urban areas in terms of available information and entertainment.

Since the Government's efforts have focused on the expansion of television broadcasting services among the nation's rural areas in line with the objectives of the "Nationwide Television Broadcasting Network Construction Plan", television broadcasting in the Bangkok metropolitan area has been left to 4 broadcasting corporations including commercial oriented ones. As such educational systems as Sukhothai Thammathirat Open University (STOU) and Ramkhamhaeng University (RU)'s educational programs which utilize television and radio broadcasting services have become widespread, however, the Government of Thailand has been confronted with the necessity of establishing a national broadcasting station to solve problems of securing satisfactory daily broadcasting time and broadcasting to rural areas through a nationwide television network.

In the light of this situation, the Government of Thailand decided in a Cabinet meeting in 1985 to establish a national television broadcasting key station which will not accept commercials. The Government of Thailand then originally established CH-11 as an experimental television station, started experimental broadcasting, and thereby the station obtained channel rights. After that, the Government of Thailand, formulating the Establishment Project for Education and Public Broadcasting Station Channel 11 (hereinafter referred to as "the project"), requested the Government of Japan to extend a grant aid for the project.

The outline of the request made by the Government of Thailand is to construct, on a site of 17,900 m² on the north side of the CH-11

Experimental Station, an educational and public broadcasting station with the following objectives:

- 1) To establish an educational and public broadcasting system in the Bangkok metropolitan area.
- 2) To set up a key station for national educational and public television broadcasting which is indispensable for establishing a nationwide television broadcasting network.
- 3) To establish an organization capable of producing educational and public programs on its own.
- 4) To promote the exchange of programs with foreign television broadcasting organizations.

In response to the request, the Government of Japan dispatched a preliminary study team to Thailand through the Japan International Cooperation Agency (JICA). The study team conducted a necessary survey there from March 31 to April 11 in 1986.

Based on the findings of this preliminary study, the Government of Japan dispatched a basic design study team to Thailand through JICA in the same year. The study team discussed details requested by the Government of Thailand with representatives of the Thai Government, conducted surveys of the current state of broadcasting services in Thailand, CH-11 Experimental Station and the infrastructure in and around the project site, and collected relevant information and statistical data from July 22 to August 9. The outline of the survey is as shown below.

- (1) Administrative system and facilities at CH-11 (experimental station)
- (2) Contents of programs broadcast by existing CH-11 and future plan for programs.
- (3) Administrative systems and facilities at regional centers of Television of Thailand (Khon Kaen, Surat Thani and Phukets).
- (4) Infrastructure and ground conditions in and around the project site.

(5) Survey of related facilities.

(6) Survey of educational program producing organizations.

The study team held discussions with representatives of the Government of Thailand based on the findings of the survey and signed the Minutes of Discussions on the objectives and contents of this project on July 31, 1986.

This report is designed to summarize the findings of the basic design study with reference to the above-mentioned facts.

CHAPTER 2 BACKGROUND OF THE PROJECT

CHAPTER 2. BACKGROUND OF THE PROJECT

2-1 Outline of the Kingdom of Thailand

The Kingdom of Thailand is located in the center of Indo-China, lying approximately between latitudes 5 deg N and 21 deg N. Thailand covers an area of about 514,000 square kilometers, roughly 1.4 times that of Japan, and the population is about 50 million. Blessed with weather and climate, this country is called "Rice Bowl of the Orient."

Geographically, Thailand is divided into the North, Central Plain, North-East and South. The North is the basin formed by the upper tributaries of the Chaophraya, where the traditional intensive farming has been carried out. The Central Plain, a granary of the country consisting of extensive paddy fields and waterways, is a large alluvial plain in the middle and lower reaches of the Chaophraya. The North-East is of typical plateau terrain and is a relatively barren region with poor soils. And the South is a region extending southward down the Malay Peninsula, having long and beautiful coastal lines with shallow water close in shore where palm trees grow thick along Gulf of Thailand.

Climate changes from a dry season when the monsoon blows northeast, to a hot season, and then to a rainy season with the southwest winds blowing.

Thailand, one of the important members of ASEAN, has positively been promoting regional cooperation with neighboring countries and friendship with the Western countries including Japan and the United States of America at the same time. On the other hand, Thailand has also been maintaining good relationship with such neighboring socialist countries as Cambodia and Laos as well.

Approximately 80 percent of the labor force is engaged in farming, which means that agriculture is the most important industry for this country. Its main products are rice, rubber, sugar, maize, etc. In addition, such industrial minerals as tin, manganese and fluorite are produced in large quantities. Fishing and manufacturing industries have

also been developed, but the economy of Thailand is fundamentally likely to be influenced by natural conditions such as weather, price trend at the world agricultural markets and business fluctuations.

A majority of the Thai (95%) are Buddhists of strong in faith, and most young men enter the Buddhist order once in their lives. Thus, Buddhism is deeply rooted into the people's daily life and greatly influences the economy, society and culture in general. The Thai royal family, integrating itself into the people's life as the object of their respect and admiration, has been playing an important role in promoting the spiritual solidarity of the Thai people.

Historically, Japan has been closely connected with Thailand for many years, and it is said that the Japanese who travelled to Thailand aboard trade ships authorized by the Shogunate reached as many as 3,000 with a famous Japanese warrior, Nagamasa Yamada inclusive during Ayutthaya period. Since the friendship proclamation made in 1887, both countries have kept close relations. During the past decades, Japan has been cooperating positively with this country for promoting its economy and social development through various funding assistance and technical cooperation. It should be noted that the total amount of investment from Japan to this country has reached as high as approximately 1/3 that from overseas, and Japan has also been in an important position as a trading partner both in export and import.

2-2 Broadcasting Situation in the Kingdom of Thailand

TV broadcasting services in the Kingdom of Thailand were actually inaugurated by Thai Television Company established in January 1954 which started its operation in June 1955.

Then the Government of Thailand, at the Cabinet Council in May 1965 decided that within several years to come, a nationwide TV broadcasting network by PAL system should be constructed by changing the TV standard system to PAL system from the conventional NTSC system. Based on this decision, the Government of Thailand, in order to develop "Nationwide Television Broadcasting Network Construction Plan" made a request to the

Japanese Government for its investigation, and the Japanese Government accepted the request and sent a study team in 1966. Since then, Thailand has expanded and maintained its TV broadcasting network based on the above plan.

Radio broadcasting services started relatively early, i.e. in 1931, and overseas broadcasting was initiated in 1938.

Public Relations Department (PRD) of the Prime Minister's Office in the Thai Government controls mass media, public information and communication including broadcasting activities in this country, but private sectors are playing an important role in the actual operation of broadcasting activities. Almost all of the TV stations are running on a commercial basis and there is presently no radio or television fee system.

(1) Television

In Bangkok TV broadcasting services were provided on a commercial basis on four channels. But presently there are five channels available as the Television of Thailand has set up its temporary installation and started its broadcasting using CH-11 in accordance with the cabinet decision in January 1985 on the establishment of CH-11 station. The transmitting facility of this CH-11 station is entirely of temporary nature, thus making its service area much smaller than the other four existing stations which cover 80 to 125 km area in radius from Bangkok. However, only one or two stations of the above five stations possess a local network. Therefore the number of audible and visible channels in provincial areas is smaller than that of Bangkok.

The B(625/50)PAL-COLOUR* system is employed as TV system for each channel and the language used is mainly Thai.

(* Japan uses M(525/60) NTSC-COLOUR system different from the above system.)

The outline of broadcasting stations presently conducting full-scale TV broadcasting in Bangkok is as follows:

1) Mass Communication Organization of Thailand

This Organization covers Bangkok and its surrounding area using CH-9 and provides one hour news program everyday for PRD regional centers using micro wave network of Telephone Organization of Thailand (TOT) at the same time. The Organization is now envisaging the construction of the nationwide TV network and five relay stations are scheduled to be completed within the fiscal year 1986 in the central region of Thailand.

The education program of Suknothai Thammathirat Open University (STOU) is presently broadcasted on this CH-9 for 1.5 hours/day.

Broadcasting time: Monday through Friday (16:00-18:30, 19:30-24:00)
Saturday through Sunday (07:25-24:00)

The outline of TV broadcasting installation is as follows:

a) Transmitting facilities (located about 20 km north of the center of Bangkok)

- * Height of tower : 250 m (Guyed tower)
- * Antenna : 4 dipoles, 6 stacks
- * Transmitter output: 20 kw (10 kw x 2)
- * Service area : 95 km in radius

b) Production & sending equipment

- * Studio : 4 rooms (768, 260, 120 and 96 square meters each)
 - * VTR : 8 sets of 1-inch-VTR and more than 20 sets of 3/4-inch-Umatic VTR
 - * OB Van : 2 Vans (plus other 2 simple type ones)
 - * STL : 2 sets (for transmitting stations and TOT)
- Transmission is performed through antenna attached to a self-supporting tower in the compound (80 m high)

2) Bangkok Entertainment Co., Ltd.

This Company covers Bangkok and its surrounding area on CH-3 owned by Mass Communication Organization. This Company is now leasing this channel from the above Organization.

Broadcasting time: Monday through Friday (16:00-18:30, 19:30-24:00)

Saturday through Sunday (08:00-18:30, 19:30-24:00)

Broadcasting equipment of CH-3:

a) Transmitting facilities

- * Height of antenna : 210 m (using the tower of CH-9)
- * Antenna : 2 dipoles, 6 stacks
- * Transmitter output: 50 kw (25 kw x 2)
- * Service area : 125 km in radius

b) Production & sending equipment

- * Studio : 4 rooms (600 and 150 square meters each and 2 400 square meter rooms)
Other 3 rooms in the city
- * VTR : 8 sets of 1-inch-VTR, 2 sets of 2-inch-VTR
and 20 sets of 3/4 inch Umatic VTR
- * Telecine chain : 4 sets

In view of installation scale, the above corresponds to a sizable station even in Japan or corresponds to the NHK Osaka broadcasting station in terms of equipment.

3) Army Television

Army Communication Bureau is operating the station using CH-5 at two revenue sources, i.e., the national treasury grant-in-aid supplied from the Government and the revenue from advertisement broadcasting fee.

Army Television has a key station in Bangkok and 5 relay stations in local areas. Programs are transmitted to the relay stations by using Indonesia's satellite. Presently, the Ministry of Education is broadcasting the adult education program twice a week for a total of one hour and 25 minutes using this CH-5.

Broadcasting time: Monday through Friday
(16:00-24:00, suspended 18:00-19:30)
Saturday through Sunday
(08:00-24:00, suspended 18:30-19:30)

4) Bangkok Broadcasting & TV Co., Ltd.

Leasing CH-7 from Army, this Company covers the Bangkok area and operates 16 local relay stations as well. Programs are transmitted to these relay stations through the Indonesia's satellite.

Bangkok station has the following equipment:

| | | |
|-------------------------|---|---------|
| Studio | : | 4 rooms |
| TV system converter | : | 1 set |
| Satellite relay vehicle | : | 1 set |

This Company is the largest commercial TV enterprise in Thailand.

Using this CH-7, Ramkhamhaeng University is broadcasting education programs for a total of 3 hours three times a week. They have been making effort to materialize a nationwide broadcasting network expansion program.

Broadcasting time: Monday through Friday (16:00-24:00)
Saturday through Sunday (08:00-24:00)

(2) Radio

There are about 240 radio broadcasting stations throughout the nation, and about 70 of them are located around the Bangkok metropolitan area. In

addition to Radio Thailand which is a national organization, there are radio stations operated by Army, Navy, Air Force, Police, Governmental organizations and universities, each of which has its own stations.

Radio Thailand is operated directly by Public Relations Department (PRD) at the national treasury grant in aid supplied from the Government, and PRD has been conducting the nationwide broadcasting by setting up numerous local stations in addition to the Bangkok key station.

Bangkok Key Station of Radio Thailand presently keeps about 20 radio studios, medium wave transmitting stations, FM transmitting stations, etc., and Radio Thailand has been operating more than 70 stations using this Bangkok Central Station as a key station. Details are as follows:

1) Radio No. 1 Network (General service)

43 stations throughout the nation

2) Radio No. 2 Network (Educational program)

12 stations in the nation (Completed with the help of World Bank loan and used mainly by STOU.)

3) Special broadcasting stations

3 stations (Thammasat University is using one station.)

4) FM broadcasting stations

More than 12 stations in the nation (Some stations are broadcasting the programs of Radio No. 1 Network with no modification, in addition to music programs.)

5) Overseas broadcasting services

Broadcasting has been made for 12 hours and 20 minutes everyday for North America, Europe and Middle East in addition to the neighboring

countries. Languages for the above are English, French, Laotian, Chinese, Vietnamese, Cambodian, Malayan, Thai and Japanese, 9 in all.

2-3 Present Status of Television of Thailand

National Television of Thailand consists of 4 regional centers and CH-11 station which is scheduled to be established as a key station in this project, and each station is in such a position as shown in Table I as suborganization of PRD.

Television of Thailand does not own a full-scale key station in Bangkok, the capital of Thailand, because it operates local stations only, consisting of 4 regional centers, 9 local television stations and about 30 relay stations for the purpose of expanding TV broadcasting to local areas. As the result of this, Television of Thailand can neither provide the service for the Bangkok metropolitan area nor establish the nationwide network. Moreover, they cannot televise CH-11 production programs either to the Bangkok area or nationwide through the local stations under control from Bangkok, and it is also impossible to provide the local station production programs for the Bangkok viewers.

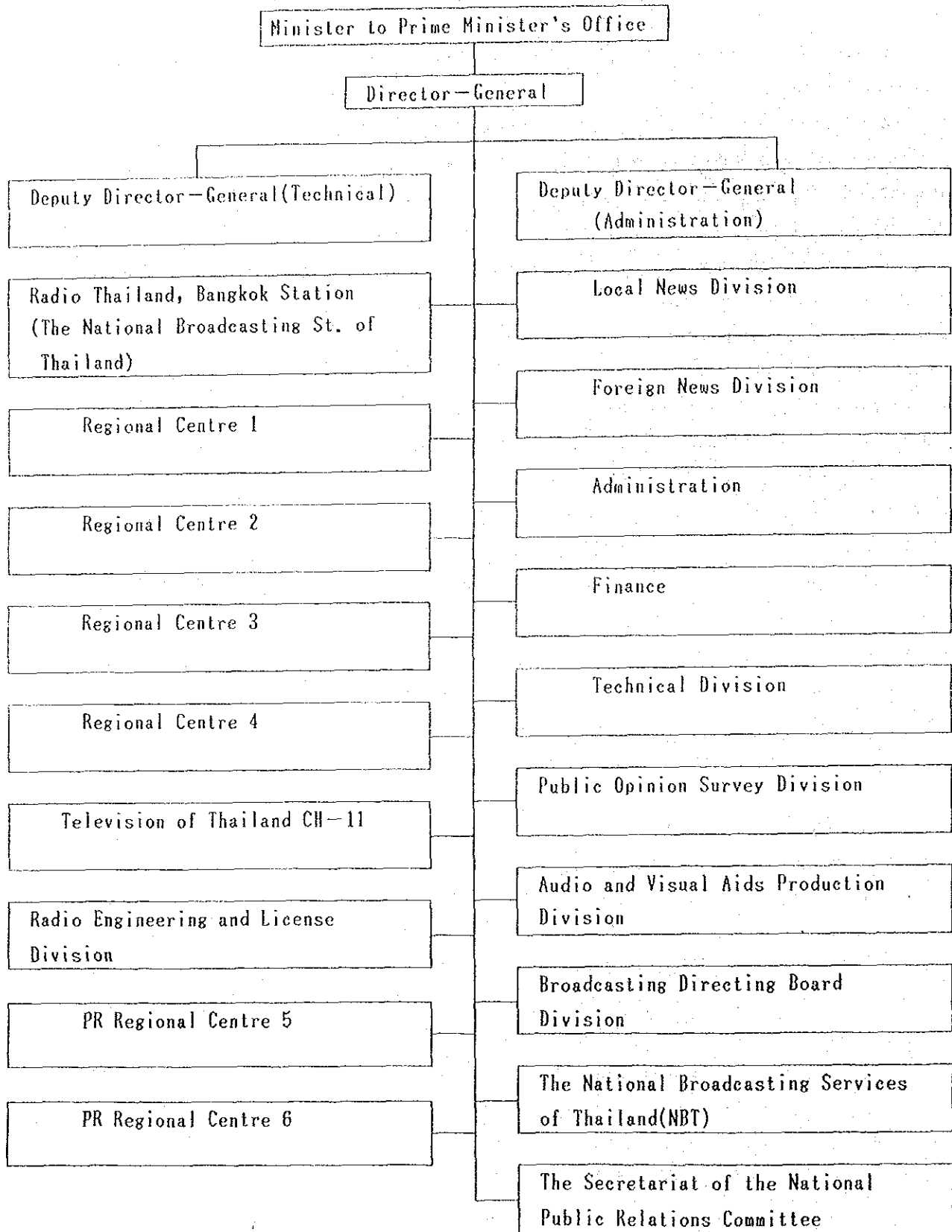
National Television of Thailand is originally in charge of producing news programs and broadcasting them nationwide, but this is not possible right now in view of their equipment.

Thus, it has been transmitting and televising the news program produced by CH-9 station (Mass Communication Organization of Thailand) production programs to each regional center of Television of Thailand by using TOW micro wave network for one hour (20:00 - 21:00) everyday. Under such situations, Television of Thailand which is required to be responsible for conducting public relations of the nation as well as for televising the education and culture programs produced by other public educational organizations such as STOU, cannot play its role, nor can they fulfill its functions thoroughly. It is accordingly one of the most important subjects for PRD to construct a national television station in Bangkok and to produce and broadcast its own news, current affairs, public relations and education

programs and to establish a nationwide television network with the above station as the center.

Presently, there is no public education TV station capable of providing broadcasting hours required for organizing STOU's curriculum in Bangkok, therefore, STOU cannot help but broadcast by buying air time of existing television stations which are operated on a commercial basis. But its air time charge is high and the TV station sides are also reluctant to televise education and culture programs, which are not directly connected to revenue. From these various reasons, it has become very difficult to secure urgently needed air time. Although it requires to make broadcasting for several hours a day, it is presently possible to do it just for one hour and thirty minutes a day. In order to secure the basically needed broadcasting hours, STOU strongly requested PRD to establish CH-11 as a key station for National Television of Thailand in Bangkok, and PRD has basically accepted it. Public organizations desiring to broadcast education and culture programs other than STOU such as Ministry of Education (CET), Ramkhamhaeng University, Ministry of Agriculture and Cooperative, etc., are in the same position in principle as STOU, and they strongly wish to establish CH-11 and then to establish the nationwide television network of Television of Thailand.

Fig. 1 PRD Organization Chart



(1) Outline of CH-11 Practical and Experimental Station

Under these situations, PRD installed temporarily transmitting equipment (transmitter output: 10 kw; tower height: about 50 m), news studio and VTR equipment in the existing building adjacent to this project site, and broadcasting has been conducted by using CH-11 since autumn in 1985. Present broadcasting programs are shown in Table II.

Present status of CH-11 practical and experimental station is as follows:

- 1) Broadcasting time : 16:30 - 21:00 (4 hours and 30 minutes)
- 2) Contents of program
 - a) CH-11 practical and experimental station production program : News (45 minutes a day)
 - b) Programs provided by government agencies : Education and culture programs from Ministry of Education, Ministry of Public Health, Ministry of Agriculture and Cooperative, etc.
 - c) Programs provided by public education agencies : Education and culture programs from STOU, Ramkhamhaeng University etc.
 - d) Programs provided by embassies of various countries : Education and culture programs from embassies of different countries and public relations organizations, etc.
 - e) Others

Table 1 Airtime of CH-11 at Present

| | |
|-----------------------------------|--|
| 16:30 - 17:00 | Departments of Forestry, Ministry of Agriculture, Ministry of Health, RU. |
| 17:00 - 18:00 | Ministry of Education |
| 18:00 - 18:30 | Cartoon |
| 18:30 - 18:35 (Wednesday only) | Agriculture Programme |
| 18:35 - 19:00 | STOU |
| 19:00 - 19:30 | Features - other government agencies |
| 19:30 - 20:00 | Features/exchange programmes |
| 20:00 - 20:45 | News |
| 20:45 - 21:00 | Features - National Identity Board/other-government agencies Foreign agencies |

3) Staff : 65 members (about 20 engineering staff inclusive)

4) Equipment

- a) Building : The existing management office building temporarily in use (adjacent to the project site)

- b) News studio (locally assembled)
 - . Studio floor : About 30 m² (ordinary office modified in use)
 - . Subcontrol room : Ordinary office modified in use
 - . Camera : 2 sets (A little better than personal type in performance. Extremely insufficient as for broadcasting)
 - . VTR : 2 sets of 3/4 in. Umatic (Installed in subcontrol room)

This news studio is scheduled to be used as a staff (program production and engineering) training room after a full-scale CH-11 station has been completed.

- c) Transmitting equipment (Transmitter scheduled for use in a local station is temporarily installed.)
 - . Transmitter output: 10 kw (U.S. RCA make)
 - . Tower : 50 m high from ground (Installed onto the above existing building top: Locally assembled)
 - . Antenna : 3 stacks and 4 faces: H panel

Judging from performance of the above transmitting equipment, it can cover about 20 km in radius if no obstacle exists. Since the city bristles with high rises, it is assumed that the receiving might be difficult even if a receiving spot is near the transmitting station unless a receiving site and antenna direction are properly and carefully chosen.

5) Operating cost

- a) Pay to staff : Covered by the government because the staff are public officials of the nation.

b) Operating cost : Experimental broadcasting was initiated in autumn in 1985, but one fiscal year has not passed yet, thus the cost is unknown. (It is assumed that electric power charge for transmitter and news program production cost might be the majority of the entire cost.)

These equipment are of entirely temporary nature, and its service area is less than 10% that of the existing commercial stations.

(2) Outline of National Local Radio and Television Stations

National broadcasting of Thailand is roughly divided into 4 local organizations (which control radio and TV), in conjunction with national administrative regions, and regional centers are positioned in the center of respective regions (Regional Center 1 - Regional Center 4) to centrally control the stations in each responsible area. The regional center is authorized to organize its own programs and broadcast them in its responsible area in principle.

Radio stations are connected to Bangkok key station of Radio Thailand through TOT relay network, and they are broadcasting mainly the programs produced by the Bangkok key station, local news and local programs as well as special programs for ethnics depending on regions.

As for television, each regional center is making its own program production and organization as local master station for each region. Contents of the programs are mainly regular hour programs such as one hour nationwide news sent from Bangkok CH-9, 1.5 hour STOU educational program, 30 minute local news, movies, dramas, local programs and public relations programs of public agencies. Broadcasting time is 16:00-24:00, Monday-Friday, and around 9:00-24:00, Saturday-Sunday as to television. Local stations, which once organized their own programs, are now joined into each regional center as the network expansion progresses and presently they are broadcasting local news and local programs on a regular or special hour basis within the program organization frame of each regional center.

Taking a look at Lampang Regional Center in the city of Lampang, the Center opened in 1960 and owns 2 TV studios, 300 m² and 200 m² respectively as to the broadcasting equipment, and color broadcasting was initiated 5 years ago. They keep 2 relatively new studio cameras made by JVC as well as 2 Sony VTRs. Other studio related equipment are a mixture of new and old ones.

A transmitter (output 2 kw) of Lampang Regional Center was renewed at the time of colorization 5 years ago, and a repeater (5 kw) of Chiang Mai, substation of Lampang, was purchased 5 years ago from Army television CH-5.

- . About 90 staff (50 engineering staff inclusive)
- . Annual operating cost: 4 to 6 million Bahts. PRD pays maintenance cost for broadcasting equipment.

A survey was made this time on each regional center in Khon Kaen and Surat Thani, as well as Phukets where a semi regional center is located. All of the stations except Phukets own equipment similar to Lampang Regional Center in terms of scale.

- . Studio : 2-3 rooms (for production and broadcast of news, public relations, dramas, etc.)
- . VTR : 3/4 in. Umatic (partly personal type equipment are in use.)
- . Transmitter : 5-10 kw
- . Program receiving: Received from TOT terminal station with micro wave link

Most of the equipment are old and their lives have nearly reached the limit. Original performances, however, are well kept because of good maintenance.

CH-11 station and Bangkok Radio Station presently under operation are in the same position as each Regional Center in terms of organization of PRD. In addition, Regional Centers are controlling and operating both radio and television, but in Bangkok, the radio station and the TV station are separate departments.

2-4 Situation behind the Request and its Contents

(1) Background of Request

The background of the request is considered as follows.

PRD has been carrying out the following matters step by step based on the TV Broadcasting Network Construction Plan developed in 1966:

- (a) Construction of regional centers
- (b) Construction of relay stations around regional centers
- (c) Conversion of existing NTSC system stations to PAL system

As the result of the above execution, 4 regional centers as well as local stations and relay transmitting stations attached to the above regional centers were constructed in important regions of the nation. Thus, they are operating their local network even though not fully sufficient. Subjects to be solved in the future in this long range plan are as follows:

- (d) Construction of CH-11 station
- (e) Expansion of network to unserved areas
- (f) Renewal of existing outdated equipment

The above (f) "Renewal of existing outdated equipment" has been slowly but steadily conducted with the pace of 2 to 3 stations every year using the budget of the Thai Government. Together with the above, the service area has also been expanded and improved by increasing the power of transmitters and improving antenna system, thus resulting in contributing to (e) "Expansion of network to unserved areas." Thus, (d) "Construction CH-11 station" is left unsolved as the biggest subject.

Construction of CH-11 station has been in a position as the key station of the nationwide national television network, and its construction site has been secured since 1966. Its construction, however, has not been realized yet because of the financial problem.

Though PRD is responsible for the national public relations, it does not have a full-scale broadcasting station in the capital, Bangkok, the most important area of the country. Thus, it cannot produce and broadcast the nation's public relations programs, information programs, news, current affair programs, etc., hence unable to play its original role. Nor can it organize a nationwide television network and it is hard to rapidly transmit information on important policies of the central government to the rural areas.

(2) Situation behind Request

Public information, mass media and communication in the Kingdom of Thailand are under control of PRD. PRD in charge of public relations in the nation has been constructing and operating local stations to promote television broadcasting services in local areas so far, but cannot broadcast news, Government public relations and education and culture programs either in Bangkok, capital of Thailand, or in local areas because PRD does not own a full-scale station in the capital. Thus, they are urgently forced to solve this problem. Under these circumstances, Government of Thailand made a plan to establish a national television station exclusively for education and public services broadcasting in Bangkok, and made a decision on the establishment of CH-11 station at the cabinet council in January 1985. Then, PRD temporarily installed the transmitting equipment which had originally been scheduled to be installed at a local station, in an existing building, together with a temporary antenna tower onto the building top, thus starting television broadcasting using CH-11 in Bangkok in Autumn, 1985. These equipment and systems, however, are of entirely temporary nature and the service area is very limited, thus creating a strong necessity to construct a full-scale television station, voiced from various fields.

(3) Contents of Request

In order to establish the education and public services broadcasting network necessary for starting nationwide broadcasting services of news, public information programs and education and culture programs, the Government of Thailand made a plan to construct CH-11 as the core of the

above and made a request to the Japanese Government for grant aid assistance concerning the following broadcasting equipment:

1) Transmitting System

Transmitting system and antenna tower capable of securing the same service area as that of CH-9 through which STOU is presently broadcasting educational programs in the Bangkok area.

2) Program Transmission Link

Micro wave link between CH-11 station and TOT terminal station necessary for transmitting the programs produced by CH-11 such as news program to the local broadcasting stations of PRD.

3) News Studio

News studio equipment sufficiently capable of producing and sending news programs as national broadcasting station.

4) Master Control Room

Central control room equipped with master control switcher and synchronizing signal generator which are the core equipment for CH-11.

5) Production Studio

Medium-size studio for program production capable of meeting production needs of education and culture programs which may be diversified further in the future.

6) Dubbing Studio

Equipment and studio for converting different system television programs offered by various foreign countries to PAL system and audio-dubbing from foreign languages to Thai.

7) Video Recording-Playback System

System for the recording, playback and sending of inside production programs, and playback and sending of the programs offered by the organizations concerned.

8) VTR Editing Equipment

Equipment for editing the video tapes for program material.

9) OB Van (Outside Broadcasting Van)

Vehicle equipped with devices to produce the programs outside the studio such as national events.

10) Power equipment and measuring equipment for employment and maintenance of the above broadcasting systems.

11) Station building to accommodate the above systems and equipment and their attachments.

2-5 Present Status and Problems of Educational Broadcasting

(1) Outline of Education System in the Kingdom of Thailand

After various changes in the past, the Kingdom of Thailand has been employing the 6-3-3 year system as to primary and middle school education since 1978. Those who finished the 6 year compulsory education in the primary school, 3 year junior middle school education (11 to 14 years old) and 3 year senior middle school education (15 to 17 years old), are eligible to take university entrance examinations.

Most universities employing the examination admission system have been conducting preliminary standard entrance examination at the same time, and the applicants who passed it can select the department and the university they desire, based on their test results. Then they are given admission after passing an interview test.

Since 1977, all of the national and private universities have been under control of the Office of University Affairs.

(2) History of Higher Education in the Kingdom of Thailand

Higher education in Thailand originally began about 100 years ago for boys and girls of royal families and aristocrats. Modern higher education for the general public started in 1917 when Chulalongkorn University was established.

Based on Open Admission University Establishment Act enforced in 1933, Thammasat University was established, and this made the door to universities open widely to the general public. Thammasat University, however, confronted the difficulty in expanding the educational facilities to cope with an extraordinary increase in the number of students, and finally the University stopped the open admission system in 1952, and they have been employing the entrance examination system since then.

Likewise, Ramkhamhaeng University, born as an open admission university in 1971, admitted a great many students so as to meet the expectation of the general public, thus resulting in the number of students registered reaching as many as 117,500 in fiscal year 1977. Consequently, the construction of education facilities could not catch up with such expansion in view of finance and time, thus the University could not but employ the examination admission system.

Government tried opening the higher education to the general public, especially for labor workers twice in the past, but it became impossible to continue the open admission system confronting the serious lack of school facilities. The Government of Thailand, reflecting upon this bitter experience in the past, developed a new system to get over this defect. As the result of this, Sukhothai Thammathirat University Act was established in 1978, and Shkhothai Thammathirat Open University opened in 1980.

Different from other universities, the students of the above university are basically required to study at home, and it takes at least 4 years and 12 years at maximum to take a scholarstic degree.

School year consists of 2 terms; the first term starting in July and the second term in January every year. Each term contains 15 weeks of study period (except term end test), with 15 unit textbooks. Study program is composed of 15 unit workbooks, one self-study cassette tape, 15 radio broadcastings (20 minutes for each) and 5 television broadcastings (30 minutes each) in addition to the above textbooks. In each term, 1 to 3 study courses can be mastered, and 2 to 6 block study courses can be completed within one school year (2 terms).

These radio and television broadcasting programs have been produced at Educational Broadcasting Program Production Center (EBPC) constructed by the grant aid from Japan, which became the most important section of STOU.

(3) Present Status and Problems of Education Broadcasting

Universities employing the system which bestows diplomas by studying radio & television broadcasting programs and taking regular credits are Sukhothai Thammathirat University (STOU), Ramkhamhaeng University (RU) and so on.

As stated in the purpose of foundation, STOU gives the qualification corresponding to the contents learned in which the students should take all the necessary credits by the above method. RU has its campus in the city of Bangkok and is employing a system in incorporating classes held in the normal classroom.

There are public organizations hoping to broadcast their own education and culture programs through television, namely Thammasat University, Kasetsart University, Udom University, Ministry of Education, Ministry of Agriculture and Cooperative, etc.

A broadcasting system is composed of a sender (broadcasting station) taking charge of production and broadcasting of the programs, and a receiver (listeners and viewers) who listen and watch. Education broadcasting can be effective only when each of these components (production, broadcasting and receiving) displays its function properly.

For public education organizations including STOU and RU of which study method is mainly to use broadcast (television and radio), if just one component mentioned above malfunctions, the programs would not be utilized effectively, thus resulting in a big obstacle in executing the mission.

Findings of the study of each component are as follows:

1) Program Production

Program production equipment of STOU, RU and CET are outlined as follows:

- a) STOU (Studio: 3 rooms, and sufficient related equipment such as VTR and telecine chain, etc.)
- b) UR (Studio: 2 rooms, and related equipment such as VTR provided)
- c) CET (Studio: 1 room with VTR, Telecine chain, VTR editing equipment, etc.)

They are presently producing the programs at the request of each organization, and it is considered that they can deal with the requirement in the future as well.

Production staff are well capable because of their experiences in the past.

Equipment and program production capability of Thammasat University, Kasetsant University, Ministry of Education and Ministry of Agriculture and Cooperative are lower than those of STOU and RU, but they have been conducting program production at the request of each organization.

In conclusion, their production capabilities of education and culture programs are sufficient.

2) Receivers

Taking a look at the viewers to receive broadcasting programs, it is estimated that there are more than 3.5 million television sets in Thailand (3.3 million sets in 1983), and now over 1 million sets in the Bangkok metropolitan area (0.97 million sets in 1983). From this prevalence, it can be said that audiences are ready to receive the educational broadcasting programs.

3) Broadcasting

There are presently 4 television stations equipped with a full-scale broadcasting equipment in Bangkok, area, and CH-11, the fifth station, is broadcasting within a very limited scope as an experimental station.

These 4 stations, however, are operated on a commercial basis and their financial infrastructure rests on commercial fee. Accordingly, as their management policy, their emphasis is placed on amusement programs which bring commercial fee, and they are reluctant to broadcast education and culture programs with cheap air time charge and with no commercial fee. For STOU for instance who should pay the air time charge, it might be considered too expensive, thus resulting in a decrease in broadcasting hours.

In the case of STOU, for example, they can broadcast only for one and a half hours a day on CH-9 in the Bangkok area, in spite of 5 hours required for each day, which restricts opportunities of broadcasting programs produced with strenuous efforts by EBPC. Thus both organizations are confronting a difficulty in accomplishing their original mission.

Judging from the findings of the study stated above, it can be concluded that the problem of broadcasting educational and cultural programs in Thailand exists on the part of broadcasters.

The construction of a new national TV station in Bangkok by the present project will solve the problem by providing adequate broadcasting time

to educational organizations. It will consequently contribute to the furtherance of education in Thailand.

CHAPTR 3 CONTENTS OF THE PROJECT

CHAPTER 3 CONTENTS OF THE PROJECT

3-1 Objectives

National Television of Thailand, a suborganization of PRD, cannot produce and broadcast the programs of news, Government public relations, education and culture, etc., because they do not own a full-scale broadcasting station in Bangkok, the capital of Thailand. Nor can they broadcast these programs either to local stations or nationwide.

This means that they cannot execute their obligation to broadcast the nation's public relations and education and culture programs throughout the nation. This is the original mission assigned to the National Television of Thailand. Thus, a strong request has been made to the Government from STOU and other public organizations to solve these problems.

The purpose of this project is to accomplish the following matters by constructing an education and public services broadcasting station (CH-11 station) in Bangkok in order to solve various problems which Television of Thailand is now facing.

(1) Expansion of TV Education and Culture Program Broadcasting Hours

Television broadcasting time necessary for carrying out their mission should be assigned to STOU, RU and Ministry of Education and so on.

(2) Improvement of Production and Broadcasting of Public Information and Public Relations Programs

As a public service broadcasting station, they should be provided with the capabilities to smoothly produce and broadcast the programs concerned with public service information and public relations which are objective and good in contents.

(3) Establishment of nationwide national television network

CH-11 should be provided with the function as a key station for a national television broadcasting network in Thailand so as to make the nationwide simultaneous broadcasting possible.

3-2 Study of the Contents of the Request

(1) Assumption in studying the contents of the request

Study of the above was made with the assumption of analysis of the following matters which are essential to operation and management of CH-11 station;

1) Program transmission table of CH-11

Program transmission table shows the purpose and nature of the broadcasting station clearly. Proposed program broadcasting time allocation of TV CH-11 (temporary) scheduled to be initiated after completion of the CH-11 project has already been prepared. (Refer to Table 2.) This program was agreed and developed basically by PRD, the upper agency of CH-11, and outside organizations who are users or will broadcast the education and culture programs (STOU, Ramkhamhaeng University, Ministry of Education, etc.).

Although further study is needed, it is considered that this proposed broadcasting program is reasonable and appropriate to carry out the mission as an education and public service broadcasting station.

2) Production and direction method for broadcasting program

Contents of broadcasting equipment vary greatly with the production and direction methods, hence it is necessary to know how the programs are produced and directed in order to decide the contents of the equipment.

Table 2 Proposed Broadcasting Time Allocation of TV CH-11

| Time | MON | TUE | WED | THU | FRI | SAT | SUN | Time | |
|---------------|---|-----|------|-----|------|-------------------------------------|------|------------------|------------------|
| 5.25 | Opening | | | | | | | 5:25 | |
| 5:30 - 6:00 | STOU | RU | STOU | RU | STOU | RU | STOU | 5:30 - 6:00 | |
| 6:00 - 7:00 | GOOD MORNING NEWS | | | | | | | 6:00 - 7:00 | |
| 7:00 - 8:00 | STOU | RU | STOU | RU | STOU | RU | STOU | 7:00 - 8:00 | |
| 8:00 - 9:30 | | | | | | Religion Program | | 8:00 - 9:00 | |
| | | | | | | Program from the Education Ministry | | 9:00 - 10:00 | |
| 9:30 - 10:00 | Program from the Education Ministry | | | | | RU | | STOU | 10:00 - 12:30 |
| 10:30 - 11:30 | Program from the Education Ministry | | | | | | | | |
| 11:30 - 12:30 | STOU | | | | | | | | |
| 12:30 - 13:00 | NEWS AT NOON | | | | | | | 12:30 - 13:00 | |
| | | | | | | Sports | | 13:00 - 14:30 | |
| | | | | | | Documentary | | 14:30 - 16:00 | |
| | | | | | | RU | | STOU | 16:00 - 17:00 |
| 16:55 | STATION OPENING | | | | | | | 16:55 | |
| 17:00 - 18:00 | Program from the Education Ministry | | | | | | | 17:00 - 18:00 | |
| 18:00 - 18:30 | HEADLINE NEWS | | | | | | | 18:00 - 18:30 | |
| 18:30 - 20:00 | STOU | RU | STOU | RU | STOU | RU | STOU | 18:30 - 20:00 | |
| 20:00 - 21:00 | EVENING NEWS | | | | | | | 20:00 - 21:00 | |
| 21:00 - 22:00 | Travels/Documentary/Environment/Culture/ Public Health/Education Ministry/Children/ Official/PRD/PRD Regional Centres/Mahidol U./ Thammasat U. | | | | | | | 21:00 22:00 | |
| 22:00 - 23:00 | STOU | RU | STOU | RU | STOU | RU | STOU | 22:00 - 23:00 | |
| 23:00 - 23:30 | LATE NEWS | | | | | | | 23:00 - 23:30 | |
| 23:30 - 24:00 | STOU | RU | STOU | RU | STOU | RU | STOU | 23:30 - 24:00 | |
| 24:00 | Closing | | | | | | | 24:00 | |

CH-11 is not presently producing full-scale programs but the following items have been generally studied:

- a) Production and direction method of news programs presently produced and broadcast in the temporary building.
- b) Broadcasting equipment of the existing 4 television stations, and production and direction methods of their news and current affair programs.
- c) Discussion on production and direction with program production staffers of CH-11.

Then it has been decided that the production and direction method which CH-11 will employ would be almost the same as that of the existing 4 stations.

3) PRD's ability to control and operate CH-11 station

PRD now allocates 65 staffers to CH-11 practical and experimental station and been broadcasting for 4.5 hours (16:30-21:00) a day by using temporary equipment, thus preparing for the full-scale broadcasting system.

The operation of this CH-11 practical and experimental station in the temporary building will surely give very precious knowledge and experience to the staff members in producing and broadcasting the programs after completion of this CH-11 project.

In addition, PRD has been operating and controlling many local television stations for many years so far, thus keeping staff members having enough knowledge and experience. It is necessary to increase the number of the staff to operate and control the CH-11 station full-fledgedly. The total number of the staff is scheduled to be increased up to 180 within 3 years after its operation gets started. Then, a sizable number of staffers having rich experience and knowledge and presently working for local stations will be included.

Judging from their excellent conditions such as skillful staffers having good knowledge and rich experience as well as a lot of experiences in operating local stations for many years, it is estimated that PRD would surely be capable of controlling and operating the CH-11 station of PRD.

4) Financial infrastructure

Personnel expenses for the staffers will be appropriated from the national budget because the station is operated by the Government. No advertisement broadcasting will be made (cabinet decision in May 1986), thus their revenue source will be only the air time charge paid by outside users such as STOU. According to calculation by PRD, however, the air time charge of CH-11 will be approximately 65% of that paid to CH-9 by STOU, thus it is assumed that they can well make both ends meet and they will not have a problem about the financial matters.

Based on the above analysis on the four basic items concerning the operation of CH-11 station, the following contents of the request have been studied:

(2) Study of Contents of Request

The Government of Thailand made a request to the Japanese Government to extend grant aid assistance for the following items:

- 1) Transmitting system
- 2) Program transmission link
- 3) News studio
- 4) Master control
- 5) Video recording-playback system
- 6) Editing equipment
- 7) Dubbing studio

- 8) Production studio
- 9) OB-Van
- 10) Measuring equipment
- 11) Station building

The results of the study are as follows:

- 1) Transmitting system

Thailand wants the service area to be the same as that of CH-9 by reason that STOU scheduled to be a main user of CH-11 is now broadcasting the educational programs through CH-9. As the result of study on this, it is concluded that the securing of the same service area as that of CH-9 would be reasonable.

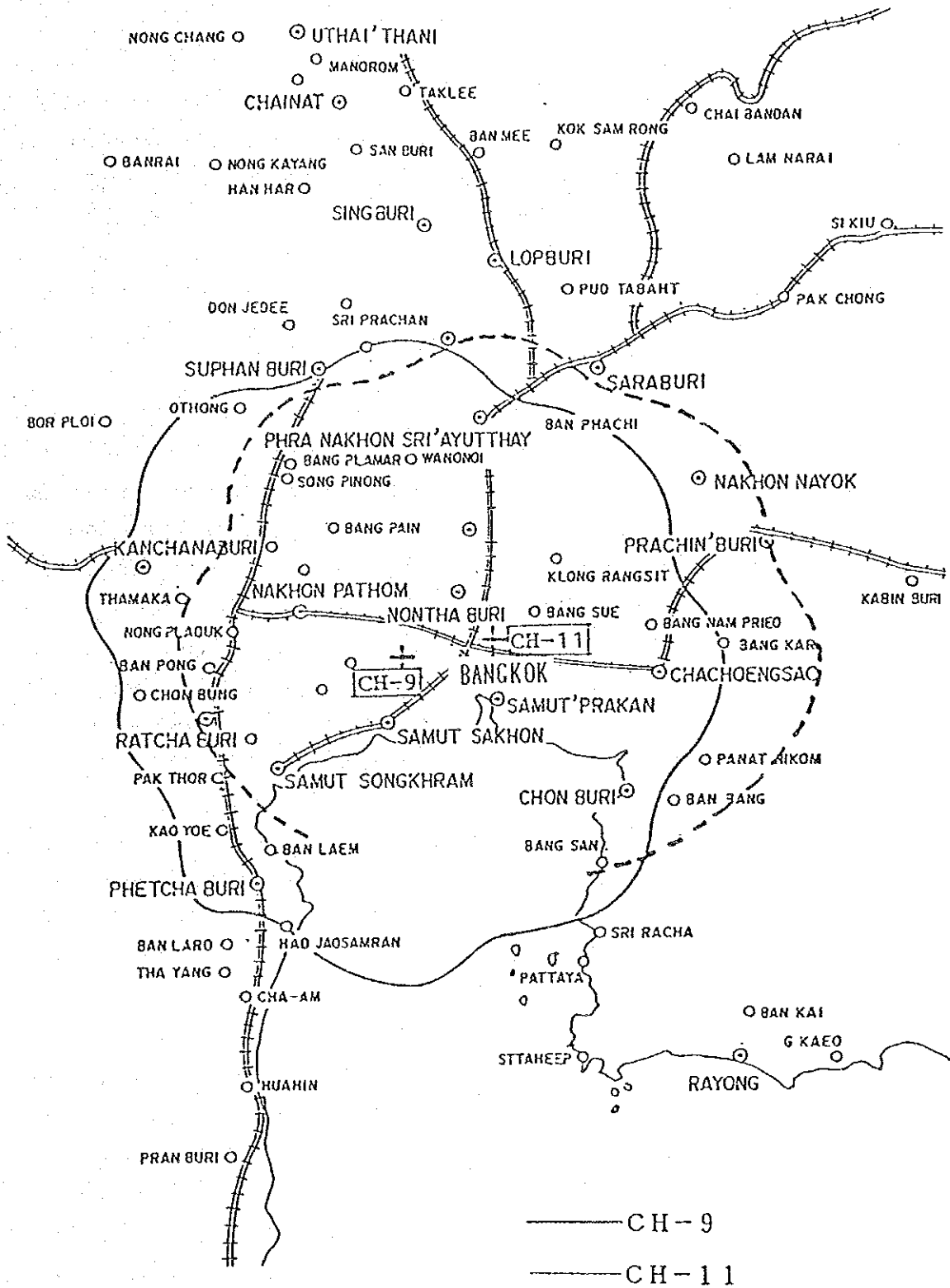
The educational programs of STOU presently being broadcast through CH-9 will be broadcast from CH-11 after completion of this CH-11 project. Accordingly, the viewers' merit of receiving educational programs on CH-9 should be maintained by all means.

In addition, in view of the nature of national public service station to broadcast news and Government public relations, the coverage should be the Bangkok metropolitan area (with population of 5,5 millions and more than 1 million TV sets), and the present service area by 4 existing stations (CH-3, CH-5, CH-7 and CH-9) within 90 km in radius (with the population of 8.5 millions in satellite cities of Bangkok) should be covered as well. (see Fig. 2)

- 2) Program transmission link

Presently, the news programs produced by CH-9 are transmitted through the nationwide micro wave network of TOT to regional centers of PRD, where the programs are broadcast nationwide, but the production and sending of these news programs will be shifted to CH-11 from CH-9 after completion of CH-11.

Fig. 2 CH-11 Service Area



With the above, CH-11 is required to broadcast not only news programs but also current affair and public relations programs through local broadcasting stations in the nation.

To realize the above, it is most efficient to transmit these programs to the local boadcasting stations in the nation by using the nationwide TOT micro wave network. In order to make it possible, the programs should be transmitted to the Bangkok TOT micro wave terminal station from CH-11, thus necessitating the installation of micro wave link.

3) Program production and sending system

(a) News studio

Presently, nationwide news programs are produced by CH-9 station but CH-11 station is supposed to take charge of this production in view of its position as a national public service broadcasting station and to make a broadcasting not only to the Bangkok area but also to the entire nation after completion of this project. It is scheduled to broadcast news programs 5 times a day for 30 minutes to 1 hour each, and this program organization is considered appropriate. In order to realize this, a news studio used exclusively for the above should be provided.

As stated before, this news studio will be frequently used and with no spare time, thus it will actually be impossible to produce other programs.

(b) Master control

A master control is the core of the television broadcasting station and the essential equipment including a program sending switcher and synchronizing signal generator and so on.

Included in this project are a news studio, production studio, multiple VTRs (1 inch VTR and 3/4 inch Umatic VTR, etc.) telecine chain, OB Van etc., as to the program sending equipment. The program

signals produced by these various equipment are sent to this master control and switched in succession according to the program transmission table. And its output goes to the input of a transmitter and STL (Studio to Transmitter Link: a micro wave equipment transmitting the programs to the TOT terminal station.) of CH-11 respectively.

Broadcasting programs of CH-11 station are sent to the TOT Bangkok terminal station by this STL, and then transmitted to each local station of National Television of Thailand by using the TOT nationwide micro wave network, thus making the nationwide broadcasting possible.

A series of these operations are conducted by the program sending switcher in the master control room, which is located in the center of the broadcasting equipment. And in order to operate these equipment and devices uniformly, the same standard signal (synchronizing signal) is required to drive them, thus necessitating the installation of the synchronizing signal generator.

(c) Video recording-playback system

The VTR recording-playback system is essential to recording, playback and sending of CH-11 production programs and playback-sending of education and culture programs provided by outside organizations (users) such as STOU, RU, CET, etc., in the form of video tape, thus the installation of this equipment is absolutely necessary.

In Thailand, records of the national events are preserved by means of film, equivalent to 30,000 hours kept at HQ of PRD and 15,000 hours altogether with 4 regional centers in terms of time. These films are stored at HQ of PRD, each regional center, Bangkok National Film Library mostly but each Governmental agency also keeps them. These record films are used as the insert material for news, documentary programs, etc.

Just one system is available for the film recording and playback, which is common worldwide, hence there is no trouble to consider the difference in system like TV signal for both receiving and providing sides of programs. A broadcasting station has gradually been switching to the recording and playback system by video tapes because of various technical defects of the film itself, but nonbroadcasting organizations are still producing and providing film programs mainly because of easiness of handling.

According to the data obtained in April this year, the programs provided by foreign organizations and being broadcast during the month by the practical and experimental CH-11 station reached as many as 43 and a little less than 16 hours in terms of time. But the latest data (as of August this year) shows that CH-11 station is broadcasting 1.5 hours a day on the average and 10.5 hours weekly, showing an increase in time allocation. 70 to 80% of these programs are documentary ones, which are normally produced in the form of film and given to CH-11 station in that form.

It is considered that the film programs of foreign make will be provided further and thus a telecine chain is required for this purpose.

(d) Editing equipment

Diversification of broadcasting programs is a general trend of the worldwide broadcasting field, and a program is composed and produced in many cases by using some materials collected. An editing equipment is required for making a series of program by connecting smoothly some materials. STOU and RU are using mainly this method to make their programs, and it is considered that CH-11 station will also produce the programs mostly by employing this method.

In order to cope with production of these programs, it becomes necessary to prepare the editing equipment including playback and recording VTRs, editor, monitor, etc. It will be possible to make

the program production work smoothly and efficiently by preparing the above equipment.

(e) Dubbing studio

Educational effect can be increased by broadcasting the overseas production programs for education and culture, because extensive knowledge which cannot be satisfied with home made production programs can easily be obtained. From this viewpoint, 43 overseas production programs (excluding rebroadcasting programs), totalling 15 hours and 53 minutes (22 minutes on the average) were broadcasted by present CH-11 station in April this year.

In case of broadcasting these programs, the difference in language becomes the first problem. When producing the broadcasting programs for overseas, each broadcasting station uses the same video as those for domestic use but records only effect sound and music except conversation and they attach the textbook of English version including conversation and narrative to the program. (As audio material, English version is prepared in some cases.) Countries provided with this program translate these conversation and narratives written in English into their own languages and then broadcast.

Another problem of overseas production programs is the difference of television standard system. It is necessary to convert the different system programs to the system domestically employed.

Practical and experimental CH-11 station does not have these system conversion equipment, thus they cannot help but obtain the very limited program tapes which are of PAL system, their own TV standard system and English version. And the outline is announced at the beginning of the program in Thai language and the whole program is being broadcast in English.

CH-11 has a plan to broadcast positively the overseas production programs and this is incorporated into the program transmission

table (temporary) scheduled to carry out after completion of this project. (These programs are scheduled to be broadcast at the time belt of 14:30-16:00 on Saturday and Sunday and 21:00-22:00 Monday through Friday.)

They are planning to exchange the broadcasting programs in a positive manner with Japan, ASEAN countries, Europe, U.S.A. and other countries as well as other organizations.

In addition, as is conducted presently by the practical and experimental station, they are expecting expansion and improvement of the programs in quality and quantity by asking positively Embassies and public agencies of foreign countries to provide their programs.

If the equipment to solve technical problems such as conversion of TV system and audio dubbing are not provided, it will actually become impossible to accomplish the aforementioned plan. In addition, the availability of overseas production programs will be restricted, and the scope, quantity and contents of programs to be exchanged with different countries including Japan will be very limited, thus resulting in making its expansion hopeless.

In view of language also, it makes a rule in Thailand that the language used for broadcasting is Thai, but it will be against the rule that CH-11, national broadcasting organization, broadcasts foreign languages, and this would be unkind and unsatisfactory to the general audiences.

Accordingly, a dubbing studio and television system conversion equipment are required for solving these problems.

(f) Production studio

According to the program transmission table, it is scheduled to broadcast religion, culture and documentary programs for 5 hours every Saturday and Sunday. These programs are of public service nature thus requiring an objective manner in production. In other

words, a public service broadcasting station such as CH-11 can only satisfy this requirement.

It is scheduled that the organization outside CH-11 as well as CH-11 station would use one hour from 21:00 hour every evening, and CH-11 station is planning to broadcast various education and culture programs produced by themselves. These programs, aiming at family culture, adult education and baby education, are different in nature from those of STOU, RU and CET, thus being of prime importance. It is also necessary to make their contents attractive by proper direction method. Broadcasting effect cannot be expected unless education and culture programs can draw attention of the viewers, to say nothing of amusement programs.

In order to produce attractive programs, it is important to produce a program having a variety of contents not only by talking one-sidedly to viewers but by employing various direction methods such as a face-to-face talk, round-table talk, music performance, drama, etc.

Thus, it becomes necessary to provide a production studio capable of producing the programs which reflect the producer's directing intention thoroughly.

(g) OB Van (outside broadcasting Van)

Live broadcasting of big national events, recording of sports or news as well as traditional arts and performances on site are very important programs to meet the viewers' expectation of CH-11. These programs are all produced off the studio, thus it is extremely effective to keep an OB Van onto which the outside production equipment are mounted to cope with the above requirements.

4) Measuring equipment

In order to keep a good quality broadcast all the time, it is absolutely necessary to maintain the broadcasting equipment in good conditions,

thus requiring routine and regular maintenance. Whether or not the equipment are in satisfactory conditions can only be determined by measuring various properties of the equipment using the measuring instruments.

Consequently, the measuring equipment are essential for operation and maintenance of the broadcasting equipment.

5) Power source

Electric power source is required for operation of the broadcasting equipment. According to results of the investigation made this time, it has been confirmed that power supply in Bangkok is sufficient with rare power interruption (several times a year and several minutes once if any), and voltage fluctuation is within $\pm 10\%$.

But, $\pm 10\%$ voltage fluctuation is too high for the broadcasting equipment composed of complexed and sophisticated electronic devices. To operate the equipment safely and assuredly the less fluctuated and stable power in voltage should be supplied, thus requiring automatic voltage regulator to be provided.

And the lighting control equipment presently used with the semiconductors is an efficient device because of its easy operation and less power loss, but generates the pulse voltage. If this pulse voltage is mixed into the audio equipment, noise may be produced, hence the transformer should be inserted into the lighting isolation power source to cut the noise invasion.

3-3 Project Synopsis

3-3-1 Executing Agency and Administration System

(1) Executing Agency

The agency responsible for the execution of this project is the Public Relations Department (PRD), the Office of the Prime Minister. PRD, as a

supervisory agency of The Television of Thailand, is in charge of the operation of four(4) regional centers, nine(9) local broadcasting stations, about 30 transmitting stations and existing CH-11 experimental station inaugurated in 1986, and it will supervise the activities of the full-scale CH-11 station which is expected to function as a key station for The Television of Thailand.

(2) Administration System

PRD has a long experience in operating regional centers. Program formation for CH-11 is determined by the Program Formation Committee of which membership includes representatives of such educational program producers as STOU, RU, etc. The programs thus determined clearly show the characteristics of CH-11 as an educational and public broadcasting station, giving guidelines for determining the operational framework including running expenses and staff arrangement.

As described in Chapter 2-2, CH-11 will be allocated under PRD to function as a key station for a nationwide network operated with information and instructions given by PRD. The organization framework of CH-11 is as shown in the following chart. PRD, having already assigned the director of CH-11, is now making efforts to organize the administrative system of CH-11 so that it may be established before the commencement of the project implementation.

3-3-2 Basic Policy

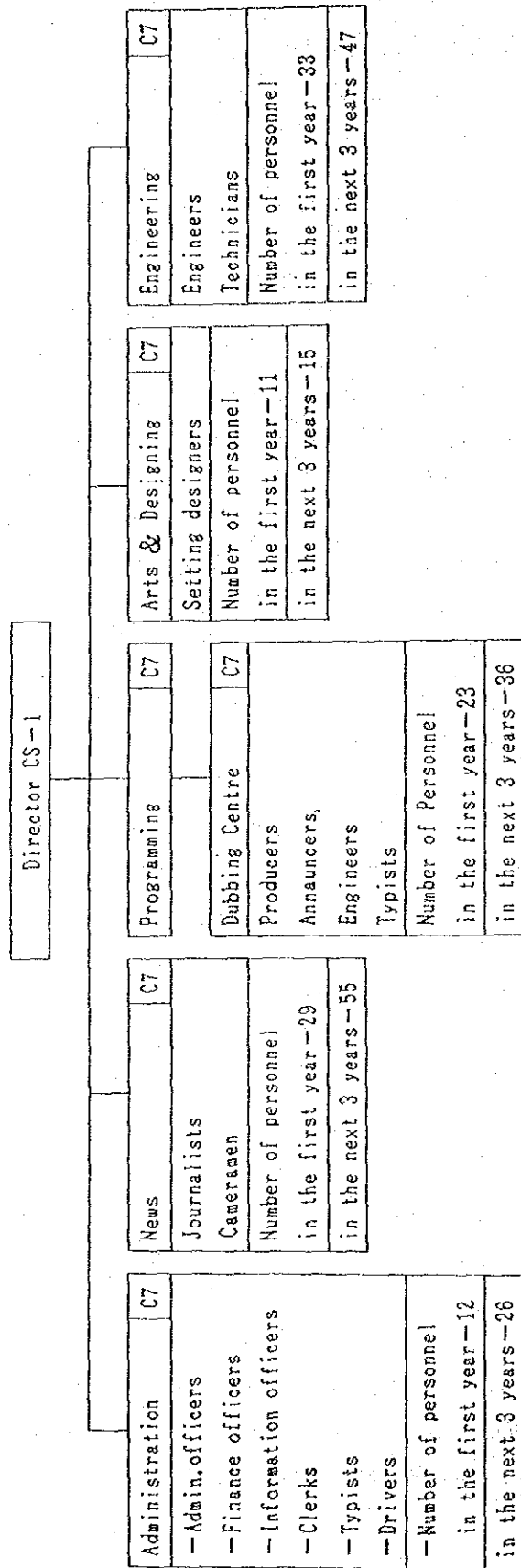
Purposes of establishment of Education and Public Services Broadcasting Station Channel 11 are as follows:

- 1) Education should be developed and expanded by offering sufficient broadcasting time to education programs produced by public educational organizations.

Sufficient broadcasting time should be given to the organizations producing and broadcasting education and culture programs such as STOU, RU and KU at a reasonable air time charge.

Fig. 3 Television of Thailand (TVT) Channel 11
 Organization Chart

Television of Thailand (TVT) Channel 11
 Organization Chart



- 2) Responsibility as a public services broadcasting station should be carried out by producing and broadcasting such programs as news, current affairs, and public relations and so forth.

It is appropriate that such programs as news, current affairs, public relations, etc., should be produced and broadcast by public broadcasting organizations in view of their public nature, and CH-11 is required to fulfill these responsibilities as a public services broadcasting station.

- 3) CH-11 should be given the functions as a key station of the national television broadcasting network of Thailand.

In order to establish a nationwide network system of National Television of Thailand, it is necessary to connect CH-11 station with each regional center by using TOT micro wave network. At present, TOT Bangkok terminal station is connected with each regional center with TOT micro wave network, hence national television network of Thailand will be completed if CH-11 station and TOT Bangkok terminal station are connected this time.

- 4) Exchange of overseas programs should be promoted and more foreign programs should be broadcast.

National Television of Thailand is positive in exchanging overseas programs and the present CH-11 practical and experimental station is also broadcasting various overseas programs. Even after completion of this project, they intend to expand and develop such plans, which are clearly shown in the program transmission table (temporary).

3-3-3 Location and Conditions of the Project Site

(1) Site Location

The CH-11 experimental station is located approximately 10 km east of the central government office district where PRD's office is, and the project site is situated approximately 80 m north of the CH-11 station annexed to the New Petchburi Road. Between the project site and the CH-11

annexed to the New Petchburi Road. Between the project site and the CH-11 station runs a track of the State Railway of Thailand. Accordingly, one has to cross the experimental station's premises and the railroad track to reach to the project site from the New Petchburi Road. Since the experimental station's premises are owned by PRD just as the project site is, there is no problem in crossing the station's premises. However, there is a difference in level between the railroad track and the access road. So it is necessary to adjust the level difference. PRD will arrange the access road through renewing the land lease contract with The State Railway of Thailand before the commencement of the construction.

The project site's land area is approximately 17,900 m².

Fig. 4 Location Map

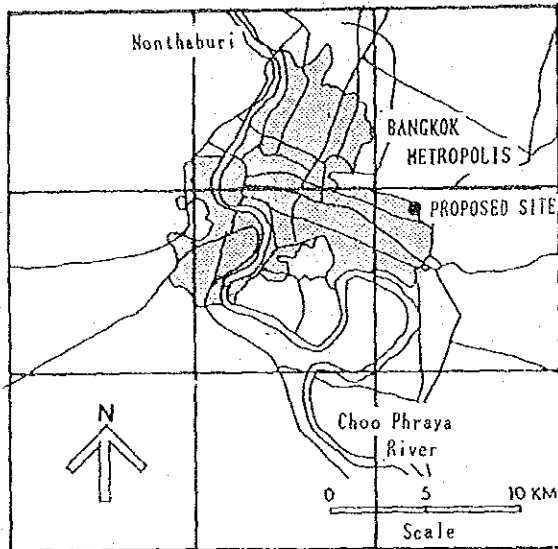
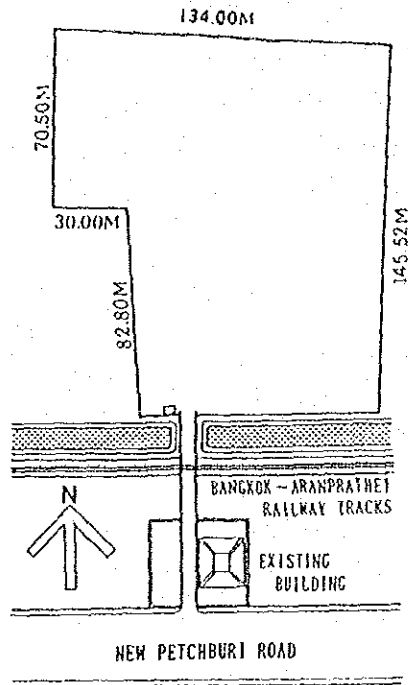


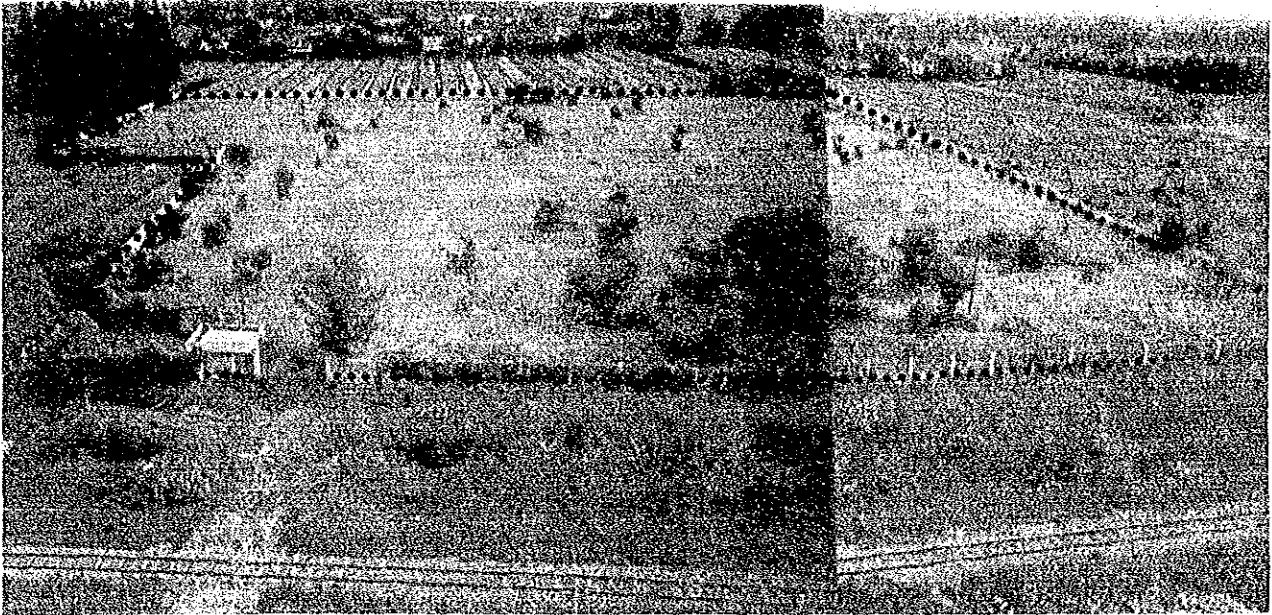
Fig. 5 Site Map



(2) Existing Conditions of the Project Site

The project site has been owned by PRD since 1968 and ground improvement was done by PRD in 1977. The ground level is equal to the height of the site of existing CH-11, and is demarcated with concrete block walls. It was confirmed that PRD will defray the expenses for extending the infrastructure such as water supply, electricity and telephone line to the site within the framework of the grant aid. Also, it is agreed that PRD will improve the road which crosses the railroad track.

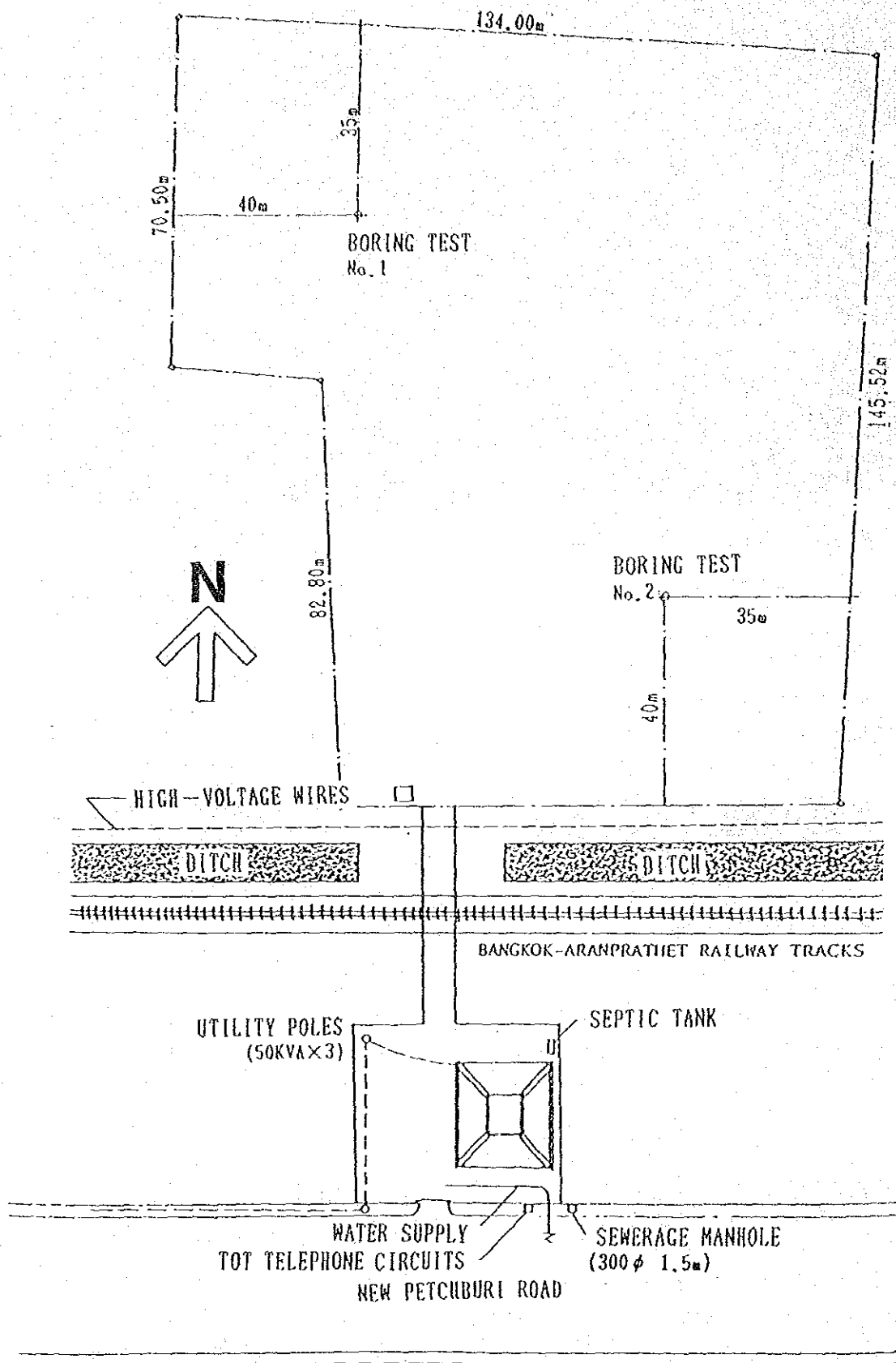
Project Site



The current state of the infrastructure in and around the project site is as shown in Fig. 6. As a result of the survey, it was confirmed that all the infrastructure necessary for this project exist within the site of existing CH-11 experimental station. Outline of the infrastructure is as follows:

- 1) Electricity: There are 350 KVA power transformers installed on the utility poles at the site of existing CH-11.
- 2) Water supply: Feeder access to the main line is located at the site of existing CH-11.
- 3) Sewerage: A sewerage pipe with a diameter of 30 cm and manholes are located by the side of the New Petchburi Road. The sewer pipe is laid underground at a depth of 1.5 m.
- 4) Telephone: TOT's telephone circuits and distribution accesses are installed by the side of the New Petchburi Road.

Fig. 6 Infrastructure & Boring Positions



Therefore, the above infrastructure can be extended into the project site. On the other hand, it is necessary to install a sewerage pipe with appropriate inclination, as long as about 150 m between the project site and the New Petchburi Road. It is also necessary to make good use of a ditch running in front of the site. One of the matters to be noted in carrying on the construction work is that high-voltage wires are laid underground in front of the project site. It is necessary to take steps to protect workers from its danger before the construction work gets started.

As regards the site's ground, boring test was done at two points on the site in accordance with the Japanese Industrial Standards and a geographical survey report based on the boring test was prepared. (See Annex)

As a result of the above-mentioned geological survey, it was confirmed that the nature of soil condition of the project site is almost the same as is reported in the relevant survey of the existing CH-11 site and other locations in Bangkok. The project site's soil formation consists of double sandy layers existing at 28 - 35 m and 45 m below GL with N value of about 25 and 50 respectively. (See Fig. 8) Accordingly, the structural design in which the sandy layer exists at GL minus 28 - 35 m is considered to be an appropriate support stratum.

As regards the foundation work, it is judged to be appropriate to employ the pile foundation for which Thai-made PC piles are available.

Fig. 7 Log of Boring

