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FOR INFORMATION

Question 10/2: Communications for rural and remote areas

STUDY GROUP 2

SOURCE: CAMBODIA AND JAPAN

TITLE: DIGITAL CORDLESS TELEPHONE SYSTEM (DCTS) PILOT PROJECT
(FOCUS GROUP 7)

Abstract: The pilot project aims to confirm the unique advantage of PHS-based DCTS in allowing the flexible expansion of telephone networks at low cost, based on cell stations that are relatively cheap to build and each one covers a radius of 2-3 kilometers with a maximum capacity of 128 subscriber lines.

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1. Introduction

In March 1999 Cambodia's Ministry of Posts and Telecommunications (MPTC) and NEC Co. Ltd. of Japan launched the joint implementation of the "MPTC DCTS Pilot Project", which aims at confirming the feasibility and effectiveness of a digital cordless telephone system (DCTS) as an essential telecommunication infrastructure in Cambodia.

In the project, the technology used for DCTS is the Personal Handyphone System Wireless Local Loop (PHS-WLL).

2. Purpose of the project

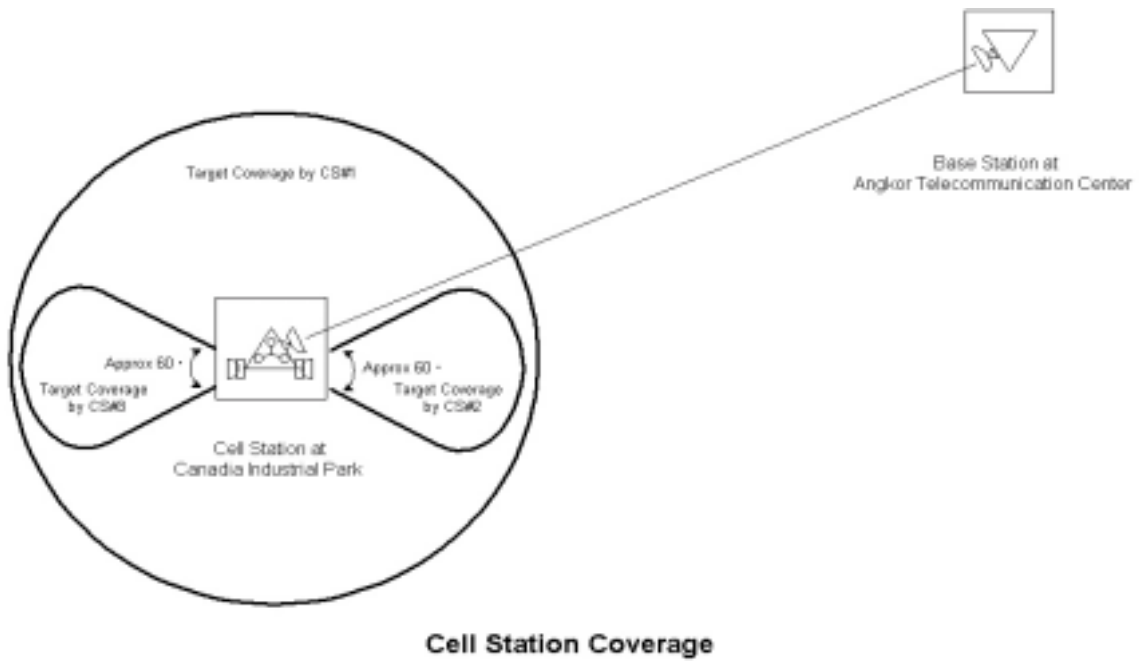
With only 10 wired subscriber lines, the Canadia Industrial Park in Phnom Penh does not have the necessary telecommunication infrastructure to support extensive industrial activities. There is an urgent need to establish such infrastructure, in order to make the industrial park attractive to investors, including those from abroad.

The MPTC DCTS Pilot Project aims to provide a practical solution to this challenge. At the same time, it is expected that the project will provide valuable information and experience regarding the possible large-scale construction of the WLL system in Cambodia, as effective and feasible technology to allow rapid and flexible expansion of the telephone network. This could assist MPTC, as the provider of the nation's telecommunication services, in dealing with the enormous and urgent task of expanding networks nationwide as the essential basis for economic growth.

3. Canadia Industrial Park, Phnom Penh

The Canadia Bank of Cambodia developed the 30-hectare industrial park in 1998 with the official support of Cambodia's Ministry of Industry. Currently, 10 factories are operating in the park, employing a total of approximately 4,800 people.

Map 1: Location of Canada Industrial Park



PHS Cell Station at Canadia Industrial Park



Factories near the Cell Station



4. Implementation of the pilot project

- (1) In May 1998, MPTC decided on the Canadia Industrial Park as the site of the DCTS pilot project.
- (2) From May to June 1998, the location and coverage of PHS Cell Stations in the park were planned and designed.
- (3) Installation of the DCTS was completed by NEC. MPTC started the service of DCTS on 22nd March 1999.
- (4) At present, MPTC is operating the pilot system, with technical support from NEC. Evaluation will continue for one year and is expected to provide MPTC with valuable information and experience regarding the potential of WLL.

5. Configuration and equipment of the pilot project

- (1) System Configuration

		<u>Quantity</u>
1	Base Station at Angkor Telecom Centre	1
2	DRMASS Repeater	1
3	Cell Stations	3
4	Fixed Subscriber Terminals	300

(A simplified system block diagram is shown in figure 1.)

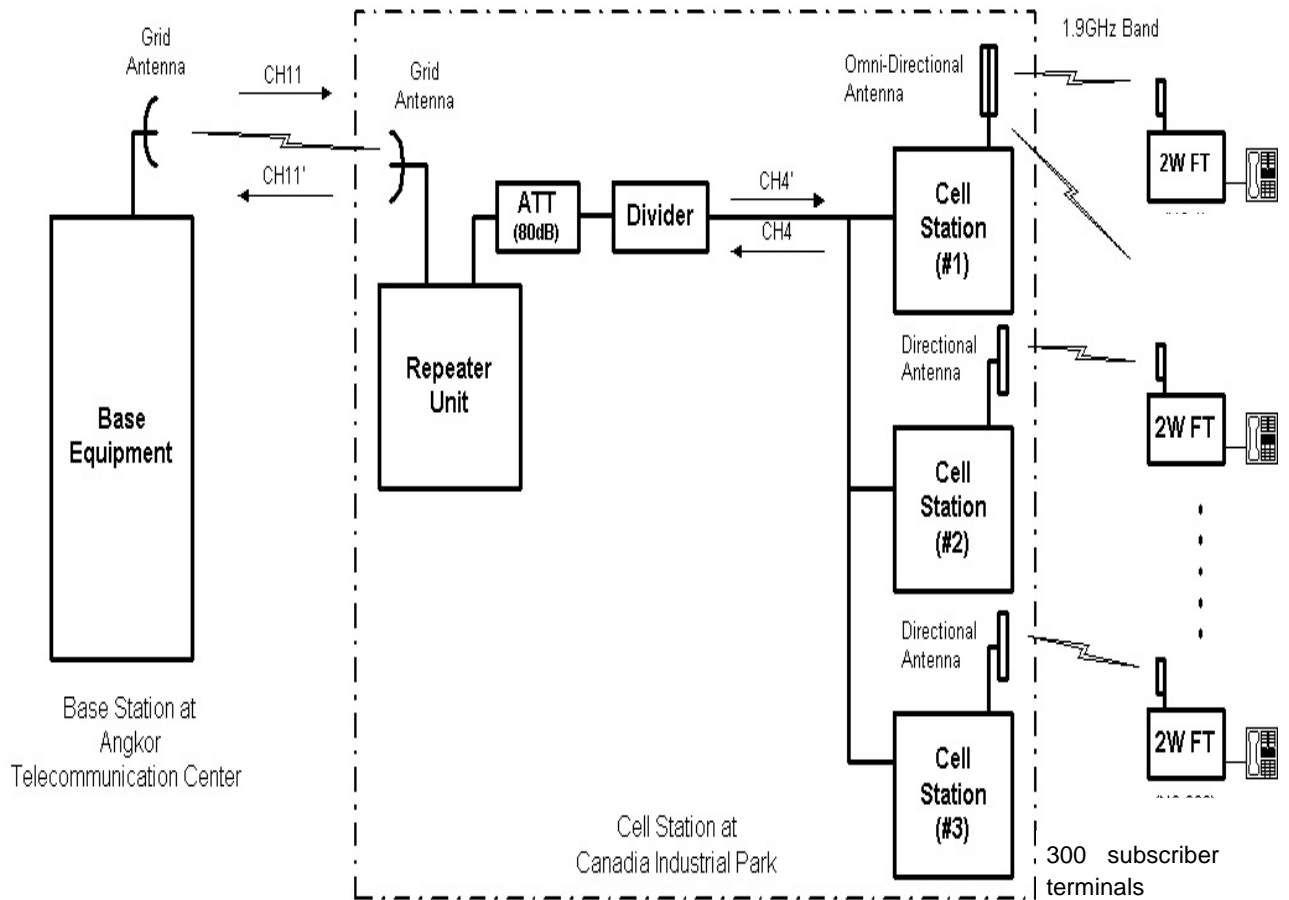


Figure 1

- (2) Installation of one base station at the Angkor Telecommunications Centre in the city of Phnom Penh, as well as 3 cell stations at Canadia Industrial Park, took one month from February to March 1999. Regarding fixed subscriber terminals, 300 sets are scheduled to be installed. The base station has a maximum capacity of 1,000 fixed subscribers and the system can be expanded to that number by adding cell stations and interface cards at the base station.

6. Services provided through the project, and charges

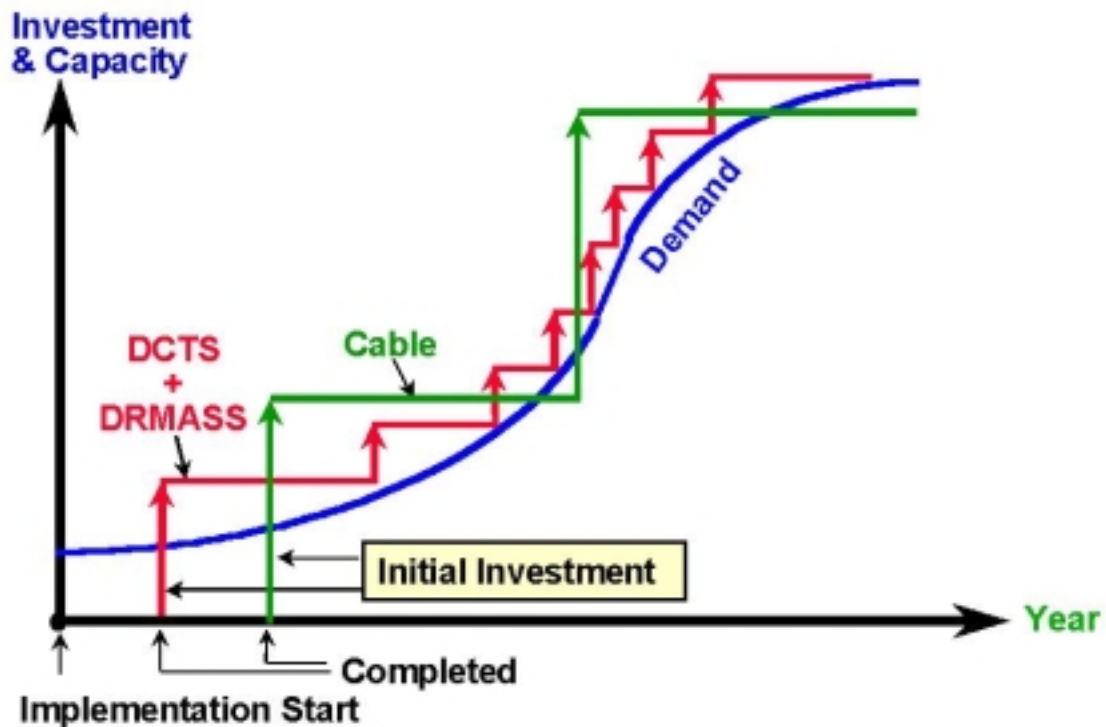
Service	Service Charges (as of July 1999)	Other Charges
Domestic Telephone Services	Local calls: US \$0.01/min (to fixed lines) US \$0.18\$/min (to mobile phones) Long-distance calls: US \$0.5/min	Installation Fee: US \$210 (including deposit); Monthly fee: US \$13
International Telephone Services	To Laos, Thailand, Viet Nam: US \$2.4/min To other Asian countries: US \$2.6/min To rest of world: US \$2.9/min	Installation Fee: US \$300 (including deposit); Monthly Fee US\$13

7. Expected socio-economic impact of the project

- (1) Canadia Industrial Park was built in 1998 in accordance with the development plan of Cambodia's Ministry of industry. However, so far, only 10 companies have been operating in the park, due to the lack of basic telecommunication infrastructure. The future success of the industrial park depends on the development of a telecommunication infrastructure, including data transmission services.

The introduction of DCTS (PHS-WLL) enables not only cost-effective basic telephony but also data transmission. DCTS also makes possible the gradual expansion of a service area at low cost, and in a way that closely matches the real needs of customers. A single cell station covers a small area and its construction costs are affordable over a short period. This allows great flexibility in expanding a network to meet local demand. (The graph below shows the relationship between the demand increase and required investment cost).

Because of these unique features, DCTS is expected to play an important role in ensuring the success of the industrial park, gradually expanding its service area at low costs that ideally suit local investors.



- (2) According to the users and network operator of DCTS, since its launch on 22 March 1999, the system has demonstrated the following advantages:
- (a) The quality of service is better than existing wired-network telephone services;
 - (b) The installation of subscriber terminals is easy, compared with the wired network;
 - (c) Compared with the existing wired network, DCTS has the clear advantage of centralized operation and maintenance of the network at the Angkor Telecommunication Centre (Base Station).
- (3) For the development of Cambodia's telecommunication network, it is essential to provide substantial assistance, such as through ODA, the support of NGOs and private investment. In this respect, the pilot project is expected to prove the feasibility of using the DCTS technology in rural applications in Cambodia, providing essential information necessary to help plan the expansion of telephone networks.

8. Main Equipment

(1) PHS-WLL system: DCTS

PHS technology was derived from digital cordless telephone technology.

High quality voice transmission through 32kbps ADPCM coding.

2W-FT

Power Source	220V AC(AC Adapter) or +9V DC
Power Consumption	4 W
Dimensions (mm)	185(H) X 130(W) X 40(D)
Weight (Kg)	0.4

FLAT ANTENNA(2W-FT)

Gain	10 dBi
Beam Width (E pl)	50°
(H pl)	60°
Diameter	240 mm



Fixed Terminal



Flat Antenna

Repeater Unit/Cell Station



- (2) Wireless Transmission system: DRMASS/P-MP microwave Transmission equipment

Traffic Parameters

Number of subscribers	1,024 line (max)
Busy hour call	0.04 Erlang/subscriber
Grade of service	1%
Number of subscriber lines for each terminal /repeater	256 line (max) per terminal / repeater

Power requirement

Equipment	Power Source	Power Consumption
BASE	-48V DC	457 W
RU	+12V DC	45 W
CS	+12V DC	43 W

Base Station



- (3) Applicable Frequency Bands
 - (a) PHS-WLL system (DCTS): 1895 MHz – 1918.5 MHz
 - (b) Wireless Transmission system (DRMASS/P-MP microwave transmission equipment): 1427 MHz – 1530 MHz
- (4) Technical standards of PHS: ITU-R, RCR STD-28
- (5) Special specifications of equipment for use in Cambodia
Temperature Max.45Ma; 90% humidity

9. Conclusion

Evaluation of the MPTC DCTS Pilot Project will continue until February 2000. During this period, the project is expected to offer not only essential telephony for the activities of the industrial park, but also valuable information and experience for the future development of rural telecommunications by DCTS in Cambodia.

10. Contacts

- (1) Officer in charge of the project at MPTC:
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Summary Report

(1) Name of Project: The MPTC DCTS Pilot Project

Notes:

MPTC= Ministry of Posts and Telecommunications, Cambodia

DCTS= Digital Cordless Telephone System

(2) Status of Project: Ongoing

(3) Project Location: Canadia Industrial Park , western Phnom Penh

(4) Type of Application/Service:

Community development,
including multipurpose telecentres

Support for small
businesses

Tele-health/Tele-medicine

Emergency support/
disaster mitigation

Tele-education

Environmental monitoring/protection

Other

(5) Type of Technology:

Mobile Telephony

Mobile data

Wireless Local Loop

Wired Local Loop

IP-related network

Satellite communications

Fixed wired network

Special specifications for
remote and rural areas

Other

(6) Initiating Organizations:

(a) Ministry of Posts and Telecommunications, Cambodia

(b) NEC Corporation, Japan

(7) Other Organizations Supporting the Project: None

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(9) Expected Socio-economic Impact of the Project

The pilot project aims to confirm the unique advantage of PHS-based DCTS in allowing the flexible expansion of telephone networks at low cost, based on cell stations that are relatively cheap to build and each one covers a radius of 2-3 kilometers with a maximum capacity of 128 subscriber lines.

The evaluation of the MPTC DCTS Pilot Project will continue until February 2000. During this period, it is expected to offer not only essential telephony for the activities of the Canadia Industrial Park, but also valuable information and experience for the future development of rural telecommunications by DCTS in Cambodia.
