



ອີທີແອລ ມະຫາຊົນ

Mobile Network Optimization

ສູນ: MNOC.

ໜ່ວຍງານ: Mobile Network Optimization.

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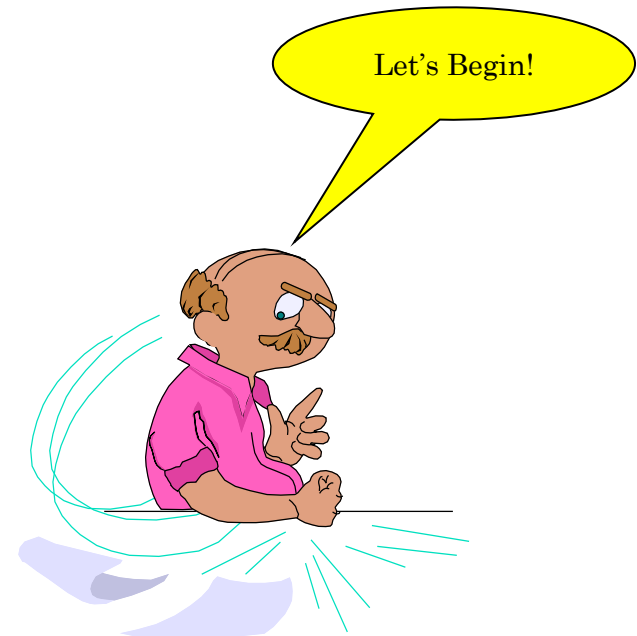


I. ຈຸດປະສົງ ແລະ ຄວາມຄາດຫວັງທີ່ຈະໄດ້ຮັບ.

- ▶ ສາມາດເຂົ້າໃຈຄວາມໝາຍຄວາມສໍາຄັນຂອງວຽກງານ Optimization.
- ▶ ສາມາດຮູ້ພື້ນຖານການເກັບກໍາຂໍ້ມູນການສໍາຫຼວດ.
- ▶ ເຂົ້າໃຈ ແລະ ສາມາດ Install Soft ware TEMS ໄດ້ໂດຍຕົວເອງ.
- ▶ ສາມາດນໍາໃຊ້ TEMS Investigation Data collection ໃນການເຮັດ DT 2G.
- ▶ ສາມາດວິເຄາະເພື່ອຊອກຫາບັນຫາ ແລະ ແກ້ໄຂບັນຫາຕົວຈິງໄດ້.
- ▶ ສາມາດເຮັດນໍາໃຊ້ TEMS Investigation Data collection ໃນການເຮັດ DT 3G.
- ▶ ສາມາດກວດກາ ແລະ ວິເຄາະການເຮັດ Handover fail.
- ▶ ສາມາດກວດກາເບິ່ງ Sector ໄຂ່ວ.
- ▶ ສາມາດກວດກາຄວາມທີ່ Overlap.
- ▶ ສາມາດກວດກາເບິ່ງຄຸນນະພາບສັນຍານ.
- ▶ ສາມາດເຮັດບົດລາຍງານຜົນຂອງການເຮັດ Optimization.

II. ຫົວຂໍ້ທີ່ນໍາສະເໜີ.

1. ພື້ນຖານຂອງ Optimization.
2. ພື້ນຖານການນໍາໃຊ້ TEMS Investigation Data collection.
3. ພື້ນຖານການວິເຄາະເພື່ອຊອກຫາບັນຫາ ແລະ ແກ້ໄຂບັນຫາ.
4. ພື້ນຖານການນໍາໃຊ້ TEMS Pocket.
5. ພື້ນຖານການນໍາໃຊ້ TEMS Investigation Route Analysis.
6. ພື້ນຖານການເຮັດ Driving Test 3G.
7. ການເຮັດລາຍງານຂອງການເຮັດ Optimization.



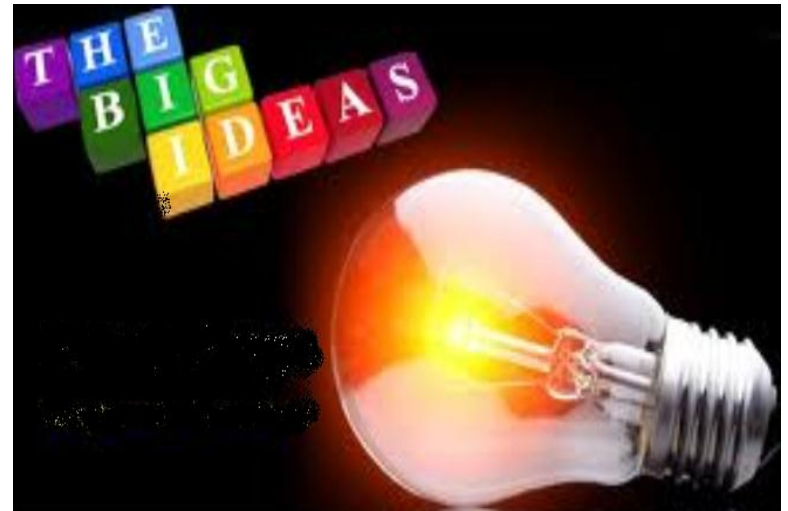
ພາກທີ 1

ພື້ນຖານຂອງການເຮັດ OPTIMIZATON.



1. ການວາງແຜນ (Radio Network Planing) ເຊິ່ງຈະມີໜ້າທີ່ສໍາຄັນຄື:

- ຂໍ້ມູນການສໍາຫລວດຂອງສະຖານີ (Site Survey).
- ການວາງແຜນ Capacity. (Capacity Planning).
- ການວາງແຜນ Coverage (Coverage Planning).
- ການວາງແຜນຄວາມຖີ່ (Frequency Planning).
- ການວາງແຜນ Neighbors Cell.
- ການ Plan ຄ່າຕ່າງໆທີ່ຈະ Config ໃນ OMC - R.



1.1. ຂໍ້ມູນການສໍາຫລວດສະຖານີ (Site Survey).

1. Location. (lon, lat ຫ້າມຜິດພາດເພາະຈະສົ່ງຜົນເຖິງການແຜນທີ່ຜິດພາດ).
2. ມູມຂອງແຕ່ລະ Cell. (ມູມແຕ່ລະ Cell ກໍ່ຄວນສໍາຫລວດໃຫ້ມີຄວາມເໝາະສົມ)
3. Downtil (ຄວນຈະປັບໃຫ້ເປັນເທົ່າໃດແຕ່ລະແຊວເພື່ອຄວາມເໝາະສົມໃນພື້ນທີ່ຕົວຈິງ)
4. ຂໍ້ມູນຂອງເສົາ. (ຮ່ວມກັບເສົາຜູ້ໃດ, ສູງເທົ່າໃດ, ເສົາ ແລະ ເຮືອນສະຖານີໄກ້ສໍາໃດ).
5. ຄວາມເໝາະສົມຂອງອຸປະກອນຂອງສະຖານີ (ຄວນໃສ່ indoor ຫລື Outdoor).
6. ລະບົບສາຍສົ່ງ (ຈະໃຊ້ Optical fiber, Microwave, VSAT ຊະນິດໃດທີ່ເໝາະທີ່ສຸດ).
7. ລະບົບໄຟຟ້າ (ປະເພດຂອງໄຟ, ການຈັດວາງ Breaker ຈຸດໃດຈິງຈະເໝາະສົມທີ່ສຸດ).



1.2. ການວາງແຜນ Capacity. (Capacity Planing).

Number of TRX.

Number of Cells.



1.3. ການວາງແຜນ Coverage (Coverage Planning).

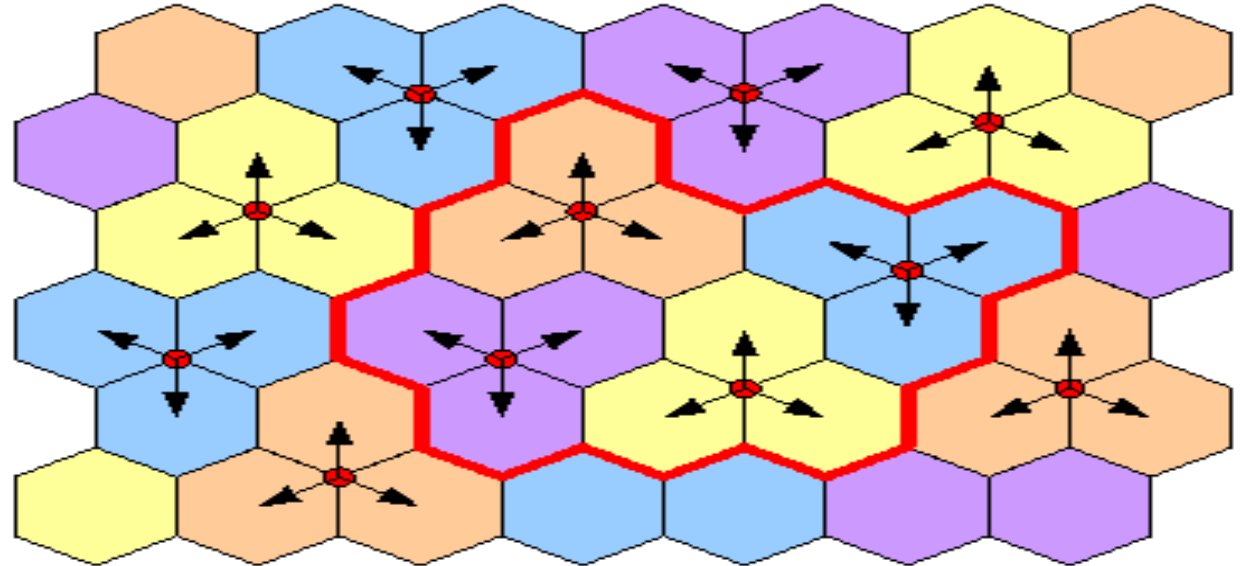
- GSM 900.
- GSM 1800.
- Azimuth.
- Tilt.



1.4. ການວາງແຜນຄວາມຖີ່ (Frequency Planning).

ການວາງແຜນຄວາມຖີ່ໜ້າຍເຖິງການຈັດສັນຄວາມຖີ່ທີ່ມີເພື່ອເອົາໄປໃຊ້ກັບເນັດເວີກຕົວຈິງ, ເຊິ່ງ ETL ຈະມີຊ່ອງຄວາມຖີ່ຢູ່ 3 ຍານຄື:

1. ຍານ E-GSM 900 = 1013 – 1023 (2.2 MHz).
2. ຍານ P-GSM 900 = 1 – 30 (6 MHz).
3. ຍານ GSM 1800 = 662 – 735 (14. 6 MHz).
4. ຍານ WCDMA / 3G = 10763, 10788 (10 MHz).



1.5. ການວາງແຜນ Neighbor Cell.

Hand Over ໝາຍຄວາມວ່າໜ່ວຍມືຖືໂທອອກຈາກ Cell A ແລ້ວ ຍ້າຍໄປຫາ Cell B ຖ້າ 2 Cell ນີ້ບໍ່ມີການ Add Neighbor Cell ກັນ ເວລາ Cell A ສິ້ນຍານໝົດແທນທີ່ຈະໄປຈັບເອົາ Cell B ແຕ່ບໍ່ຈັບມັນຈະເກີດມີ Call drop ທັນທີເພາະບໍ່ Handover.

ສະນັ້ນການວາງແຜນ Neighbor Cell ກໍ່ຕ້ອງມີການຈັດສັນ ແລະ ໃຫ້ມີຄວາມເໝາະສົມທີ່ສຸດເພື່ອບໍ່ໃຫ້ມີບັນຫາຕໍ່ການນໍ້າໃຊ້ຂອງລູກຄ້າ.



1.6. ການ Plan ຄ່າຕ່າງໆທີ່ຈະ Config ໃນ OMC - R.

ນອກຈາກມີການວາງແຜນຕາມຂັ້ນຕອນຕ່າງໆເຊັ່ນ: ຮາດແວ, ຄວາມຖີ່ Coverage, Capacity, Neighbor, ແລະອື່ນໆ ສໍາລັບການ Plan ຄ່າຕ່າງໆທີ່ຈະ Config ໃນ OMC – R ຍັງມີຄວາມສໍາຄັນເພາະມັນໝາຍເຖິງ ການໃສ່ຄ່າເຂົ້າໄປໃນຊອບແວເພື່ອໃຫ້ ຮາດແວ ແລະ ຊອບແວເຮັດວຽກໃຫ້ ມັນ Match ກັນ, ຖ້າມີການວາງແຜນມາດິທຸກຢ່າງແຕ່ຖ້າຄ່າທີ່ວາງແຜນມາ ບໍ່ໄດ້ Config ໃນ OMC-R ຕາມສິ່ງທີ່ Plan ມາທຸກຢ່າງກໍ່ເສຍຫລ້າໆ.

Parameters ຕ່າງໆທີ່ມີໃນ OMC-R ເປັນຂໍ້ມູນທີ່ສໍາຄັນທີ່ສຸດເວລາ Config ຕ້ອງເຮັດຕາມຂໍ້ມູນທີ່ໄດ້ Plan ມາທຸກຢ່າງບໍ່ດັ່ງນັ້ນຈະສົ່ງຜົນກະທົບທີ່ບໍ່ດີຕໍ່ຄຸນ ນະພາບເນັດເວີກຢ່າງແນ່ນອນ, ເຊິ່ງ Parameters ພື້ນຖານທີ່ສໍາຄັນກໍ່ຈະມີຄື: Cell name, LAC, CI, BCCH , SDCCH Frequency , BASIC ແລະອື່ນໆ.

2. ການເຮັດ Driving Test.

ຫຼັງຈາກໄດ້ຂໍ້ມູນ ແລະ ມີການວາງແຜນທຸກຢ່າງ, ຈິ່ງດໍາເນີນການຕິດຕັ້ງ ແລະ ເປີດໃຫ້ບໍລິການຈາກນັ້ນຈິ່ງເຮັດ Driving Test . ເຊິ່ງຈະມີການກວດກາດັ່ງນີ້:

- ການກວດກາທາງຮາດແວເຊັ່ນ: ການຕິດຕັ້ງ, ມຸມ, Dow tilt, ການເຊື່ອມຕໍ່ຕ່າງໆ.
- ການເຮັດ Driving Test ກວດກາຕົວຈິງເບິ່ງຄວາມເໝາະສົມຕາມຕົວຈິງລະຫວ່າງການວາງແຜນ ແລະ ສະຖານີທີ່ໃຊ້ຕົວຈິງ, ເຊັ່ນ: ທິດທາງຂອງສັນຍານ, ຄຸນນະພາບຂອງຄວາມຖີ່ແຕ່ລະຄວາມຖີ່.
- ກວດກາ Coverage.
- ການເຮັດ Hand over ແຕ່ລະ Cells.
- ການໃຊ້ Data.



ພາກທີ 2 ຜື້ນຖານການນຳໃຊ້ TEMS Investigation Data collection



1.ກ່າວທົ່ວໄປກ່ຽວກັບ TEMS.

1.1.ດ້ານ Hardware.

- LAPTOP.
- MOBILE.
- DONG KEY.
- GPS.
- Compress.
- Power Adapter.
- Data cable.



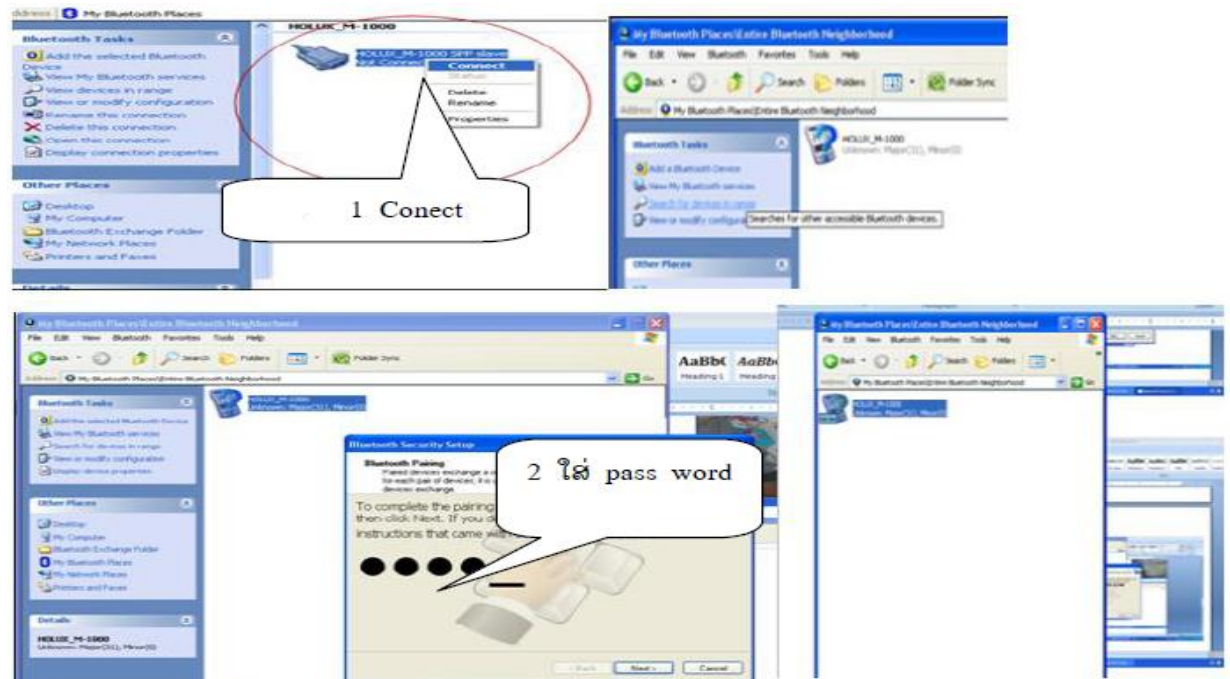
2. Install TEMS Software.

1. Off Wire fall.
2. Connect Mobile and Install Mobile Driver.
3. Install Microsoft .Net framework.
4. TEMS Investigation set up. exe
5. Copy 7 file in TEMS Patch to program file/Ericsson/TEMS product investigation/ Application to over while the original files.
6. Insert Soft dog .
7. Restart Laptop.

3.ການຕັ້ງຄ່າທົ່ວໄປ

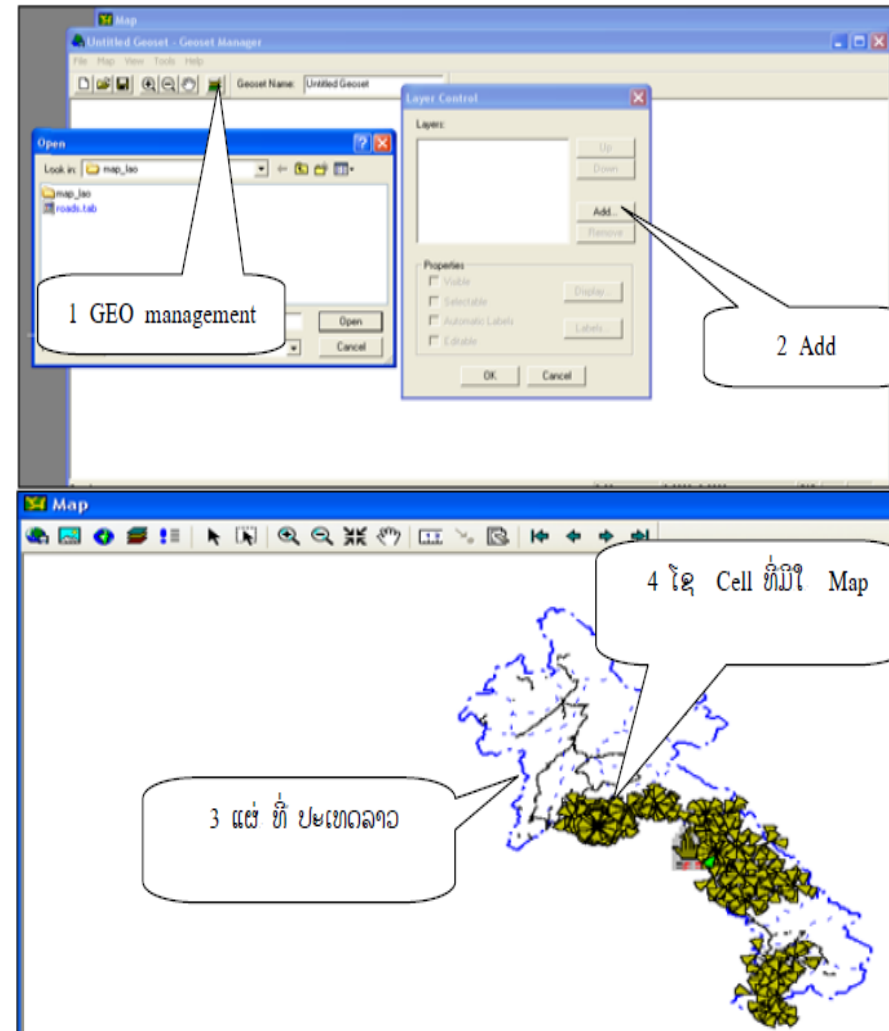
3.1. ການຕັ້ງຄ່າ GPS.

- > Add Bluetooth Device.
- > Connect.
- > Put password = 0000 > Next > Finish.



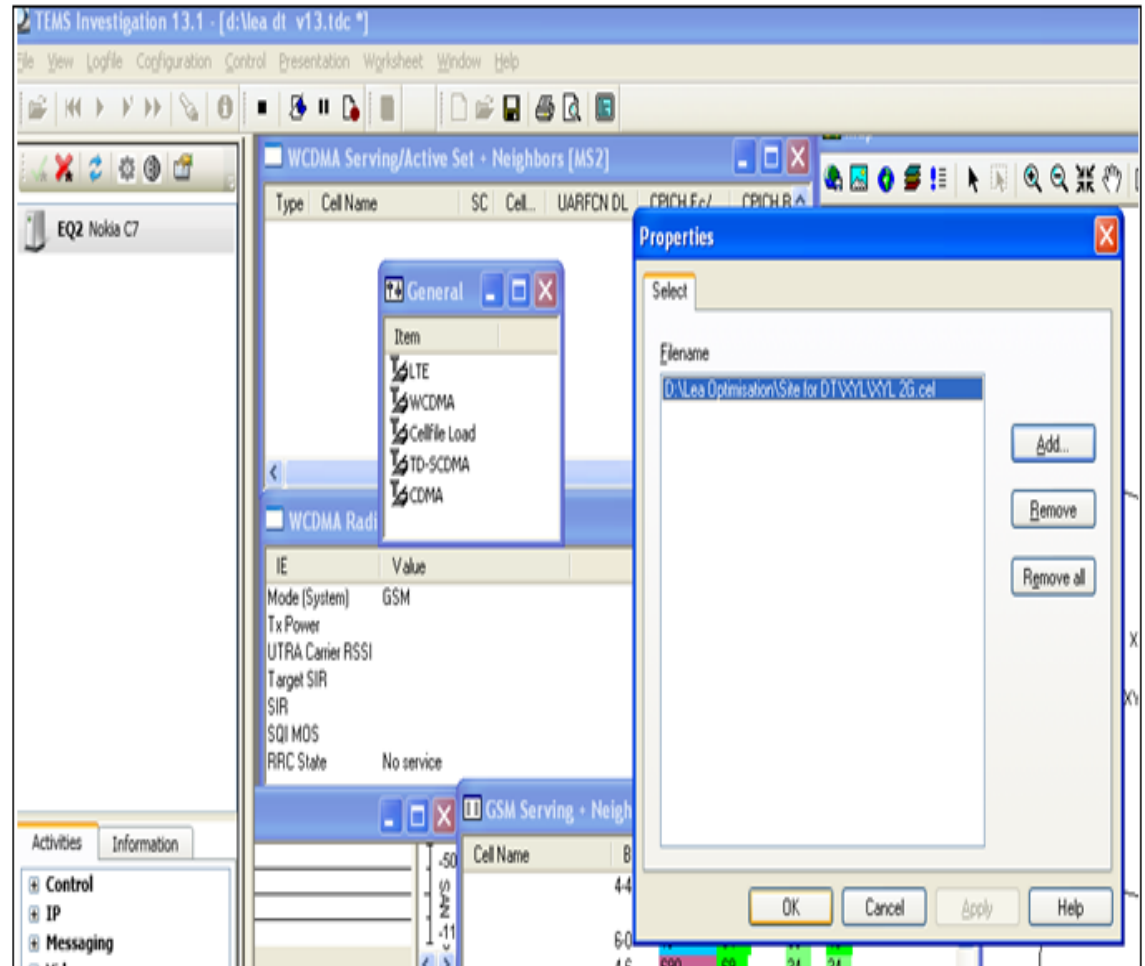
3.2. ການເອົາແຜ່ນທີ່ເຂົ້າໃນ TEMS Investigation Data collection.

- GOSSET Manager.
- Layer Control.
- Add (select Map file.TAB).
- OK
- SAVE FILE MAP



3.3.ການເອົາຊື່ສະຖານີເຂົ້າໃນ TEMS Investigation Data Collection.

- Configuration.
- General.
- Cell file load.
- Add.
- Select site file.
(file .CEL)
- OK.



3.4. Main feature.

1. Can DT GSM/WCDMA together.
2. Real time Map information.
3. DT Serving cell and Neighbor cell.
4. Support Signaling record.
5. ທຸກໆ Event can modify .
6. Can scan frequency GSM/WCDMA.
7. Can generate auto report.
8. Can Analyze log file.
9. Can support sonny, Nokia, Motorola. .. For DT.
10. Can connect GPS via Bluetooth and USB Port.
11. Can support GSM, WCDMA, LTE,
12. Can Analyzing multi log file by Route Analyzing.

3.5. Software Interface.

Software Interface

Menu
Tools
Worksheet

The screenshot displays the Ericsson Investigation tool interface. At the top, there is a menu bar with options like File, View, Profile, Scanning, Configuration, Control, Presentation, Nightview, Window, and Help. Below the menu bar is a toolbar with various icons. The main interface is divided into several panels:

- Top Left:** A graph showing signal strength and quality over time, with a color-coded bar above it.
- Top Right:** A map showing the current location and surrounding areas, with a red dot indicating the current position. The map is labeled with '215004'.
- Bottom Left:** A table showing cell information. The table has columns for Type, Cell name, SC, Cell ID, SIA, CPICH Ec/No, and CPICH RSCP. The data rows are:

Type	Cell name	SC	Cell ID	SIA	CPICH Ec/No	CPICH RSCP
MS	51017C	40	10642	10642	13.90	13.00
MN	506C	80	10642	10642	13.00	13.00
MN	573B	56	10642	10642	13.00	13.00

- Bottom Center:** A panel showing various parameters and their values, such as Tx Power (5.00), UTRA Carrier RSCP (13.00), Target SIR (13.00), RPLC State (Connected_CELL_DCH), and RAT State (WCDMA).
- Bottom Right:** A list of events and status messages, including Measurement Report (UL-DCCCH), Active Set Update (DL-DCCCH), and Measurement Control (DL-DCCCH).

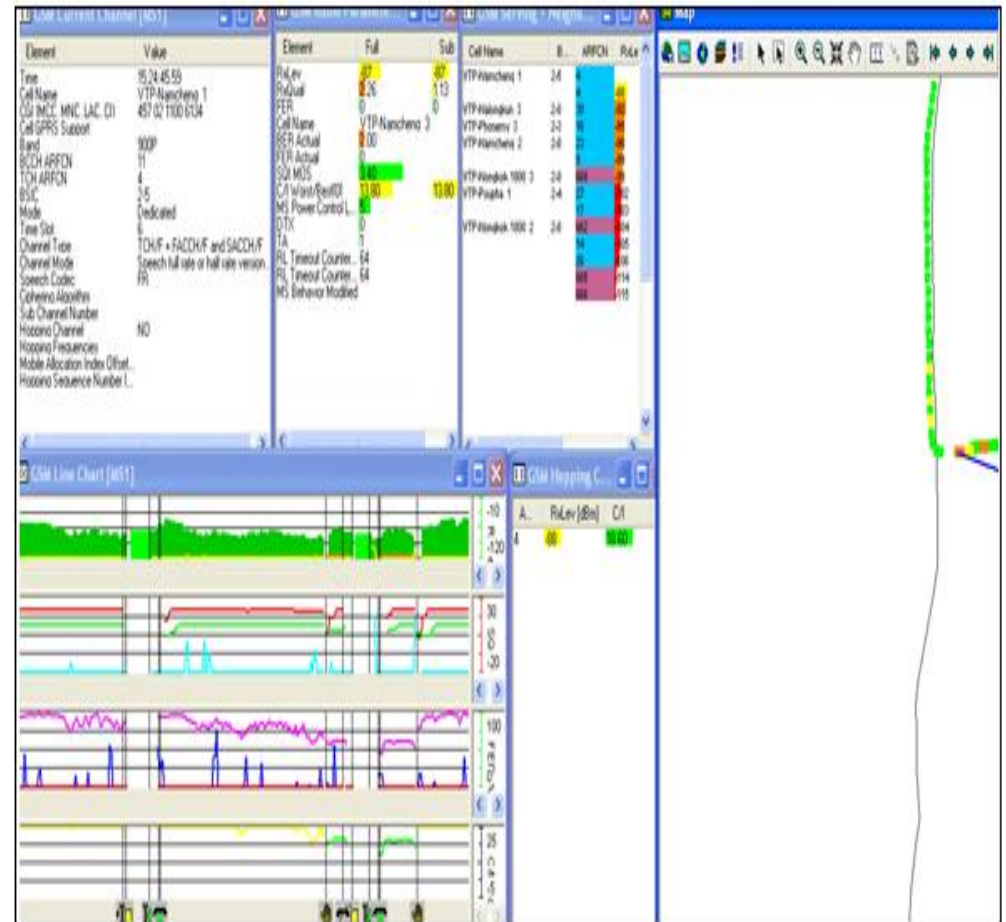
Status

2011-5-10 File: [2720_64.log] 100% Rec: []

4. ການຈັດໜ້າຕ່າງໃນເວລາ DT/2G.

ໃນການຈັດໜ້າຕ່າງໃນການເຮັດ DT/2G ມີຄື:

1. GSM Line Chart.
2. GSM Current Channel.
3. GSM Radio parameter.
4. GSM Serving+ Neighbors.
5. GSM Hoping Channel.
6. Map.



5. Equipment Status.

The screenshot shows a software interface with a 'Port Configuration' window and a main status area. The 'Port Configuration' window contains the following table:

Name	Port	Equipment
DC1	COM30	Ericsson 3G Data Cable
MS1	COM31	Y803
PS1	COM34	IMEA 0183

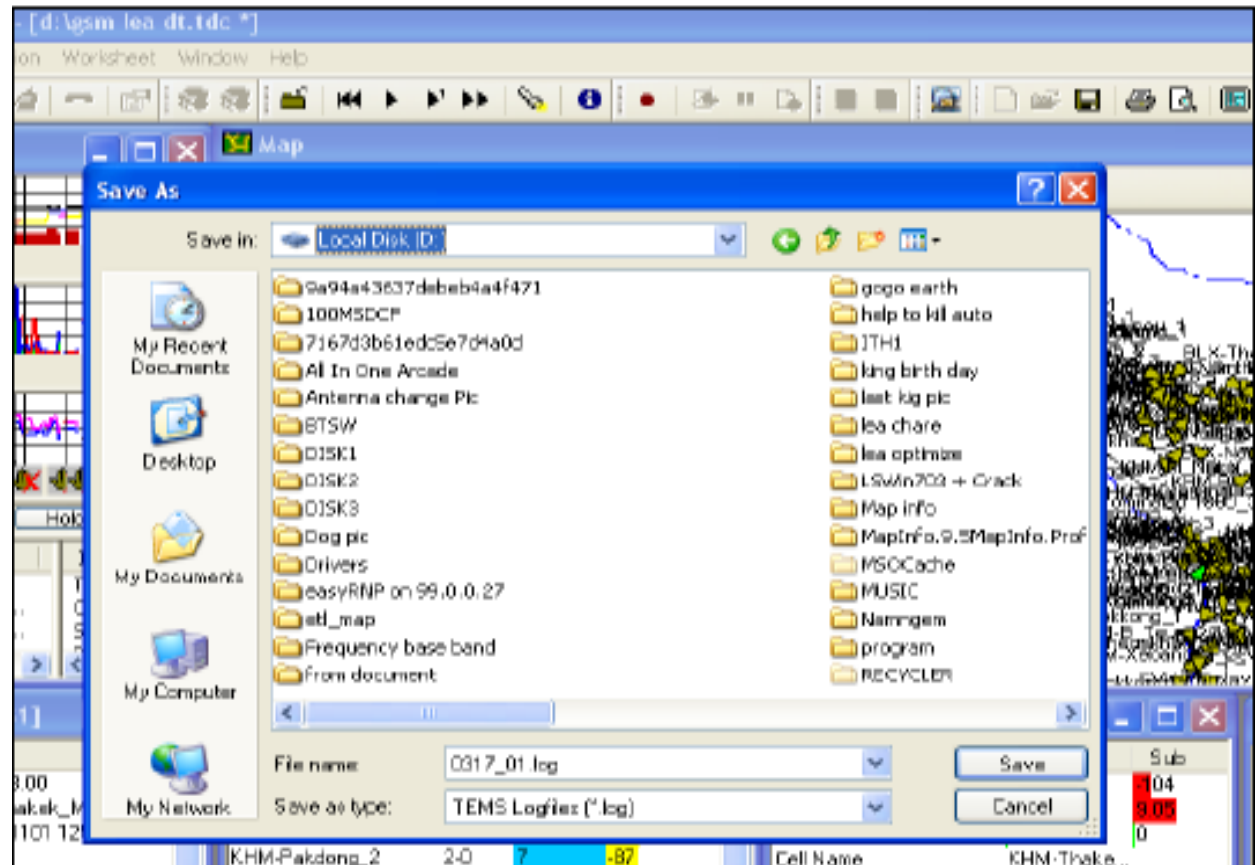
The main status area is divided into three sections:

- Status of MS:**
 - Connected: វិញ មត្តិមត្តិ
 - Disconnected: វិញ មត្តិមត្តិ
 - Executing command sequence:
- Status of PS:**
 - Connected & position valid:
 - Connected & position invalid:
 - Disconnected:
- Status of DC:**
 - Connected:
 - Disconnected:

The interface also features a toolbar at the top and a status bar at the bottom with 'Play', '0% Rec', and other icons.

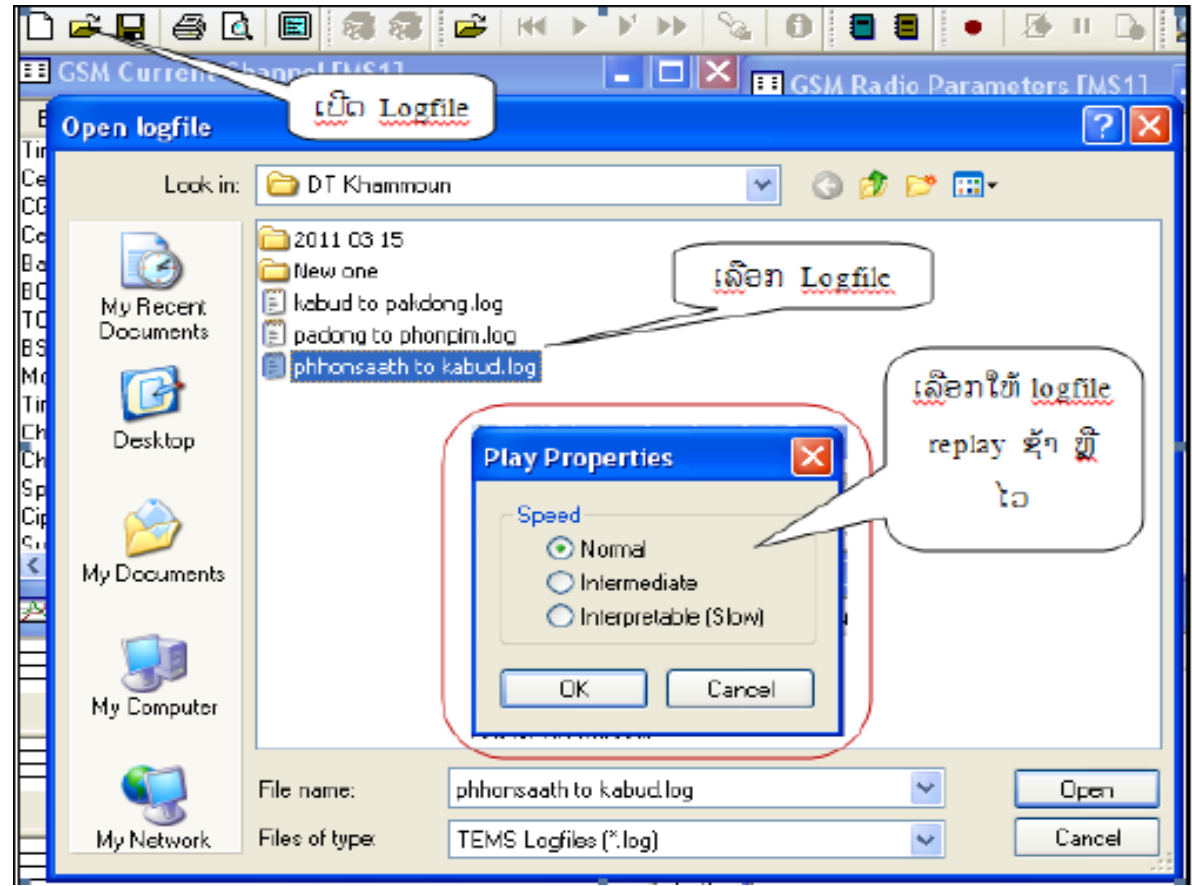
6. Record log file.

Record log file ໝາຍເຖິງການ Save log file ໃນການເກັບ Log file ຕ້ອງ Record log file ກ່ອນການເຮັດ DT ບໍ່ແມ່ນ DT ສໍາເລັດຈິງ Save.



7. Replay Log file.

- Normal.
- Intermediate.
- Interpretable.



8. Lock frequency.

Equipment Property

The screenshot shows a software interface for GSM network analysis. It features several panels: 'GSM Current Channel [MS1]' with a table of parameters, 'GSM Rx/Dx Parameters' with a table of radio parameters, 'GSM Serving - Neighbors' with a table of neighboring cells, and a 'General' settings panel on the right. A dropdown menu for 'ARFCNs' is open, showing a list of ARFCN values from 1 to 9. A red box highlights the 'Equipment Property' label, and another red box highlights the ARFCN dropdown menu with the text 'ເລືອກເອົາຄວາມຖີ່' (Select frequency).

Element	Value
Time	21:46:07.03
Cell Name	Km21_3
CDI (MCC, MNC, LAC, CI)	457 02 1130 9993
Cell GPRS Support	YES
Band	300P
BCCH ARFCN	1
TCH ARFCN	
BSIC	27
Mode	Idle
Time Slot	
Channel Type	BCCH
Channel Mode	
Speech Codec	
Ciphering Algorithm	
Sub Channel Number	

Element	Full	Sub
RxLvl	76	76
RxQual		
FER		
Cell Name	Km21_3	
BER Actual		
FER Actual		
CGI MOS		
C/I Worst/Best [dB]		
MS Power Control Level		
DTX		
TA		
RL		
RL		
MS		

Cell Name	BSIC	ARFCN	RxLvl
Km21_3	27	1	-70
CM21_3	20	18	-71
Km21_2	22	20	-71
WK_2	22	23	-76

ARFCNs: None selected

- 1 [E-930 MHz]
- 2 [E-930 MHz]
- 3 [E-930 MHz]
- 4 [E-930 MHz]
- 5 [E-930 MHz]
- 6 [E-930 MHz]
- 7 [E-930 MHz]
- 8 [E-930 MHz]
- 9 [E-930 MHz]

Select All Deselect All

ເລືອກເອົາຄວາມຖີ່

9. Scan frequency.

Start Scan

Scan Property

General

RxLvl ខອງ រេស៊ីលទ័រ ចាម ធានា បាន

ទម្រង់ រេស៊ីលទ័រ ចាម ធានា បាន Scan ៤០

Ch	Val	SCS/BSC	AGM/FON	MS
Strongest Scanned	Full	21	26 (900)	MS1
Strongest Scanned	Full	11	16 (900)	MS1
Strongest Scanned	Full	23	46 (900)	MS1
Strongest Scanned	Full	21	13 (900)	MS1
Strongest Scanned	Full	14	19 (900)	MS1
Strongest Scanned	Full	25	28 (900)	MS1
Strongest Scanned	Full	25	13 (900)	MS1
Strongest Scanned	Full	17	11 (900)	MS1
Strongest Scanned	Full	26	46 (900)	MS1
Strongest Scanned	Full	24	29 (900)	MS1
Strongest Scanned	Full	110	36 (900)	MS1
Strongest Scanned	Full	11	11 (900)	MS1

10. Scan time slot.

The screenshot shows the 'GSM Channel Verification' software interface. The main window displays a table of channels with columns for MS, BCCH, TCH, T50, T51, T52, T53, T54, T55, T56, T57, and Status. A 'Channel Verification - Add Case' dialog box is open, showing configuration options for a test case. The dialog includes fields for MS (MS1), BCCH ARFCN (17), TCH ARFCN (7), and Band (900). A 'Time slot' section has checkboxes for slots 0 through 7, all of which are checked. The dialog also has 'OK', 'Cancel', 'Apply', and 'Help' buttons. Several Thai annotations with arrows point to specific elements: 'Control' points to the 'Control' menu; 'Edit' points to the 'Edit' button in the dialog; 'Start' points to the 'Start' button in the dialog; 'Channel ที่ TEST แล้ว' points to the 'Status' column in the main table; 'ใส่ค่าความเป็น Broadcast' points to the 'BCCH ARFCN' field; 'ใส่ค่าความเป็น TCH' points to the 'TCH ARFCN' field; and 'ใส่ค่าความเป็น Broadcast' also points to the 'Time slot' checkboxes.

MS	BCCH	TCH	T50	T51	T52	T53	T54	T55	T56	T57	Status
MS1	17	17	0.	1.	2.	3.	4.	5.	6.	7.	Stopped
MS1											Not tested

Channel Verification - Add Case

Test case

MS: MS1

BCCH ARFCN: 17

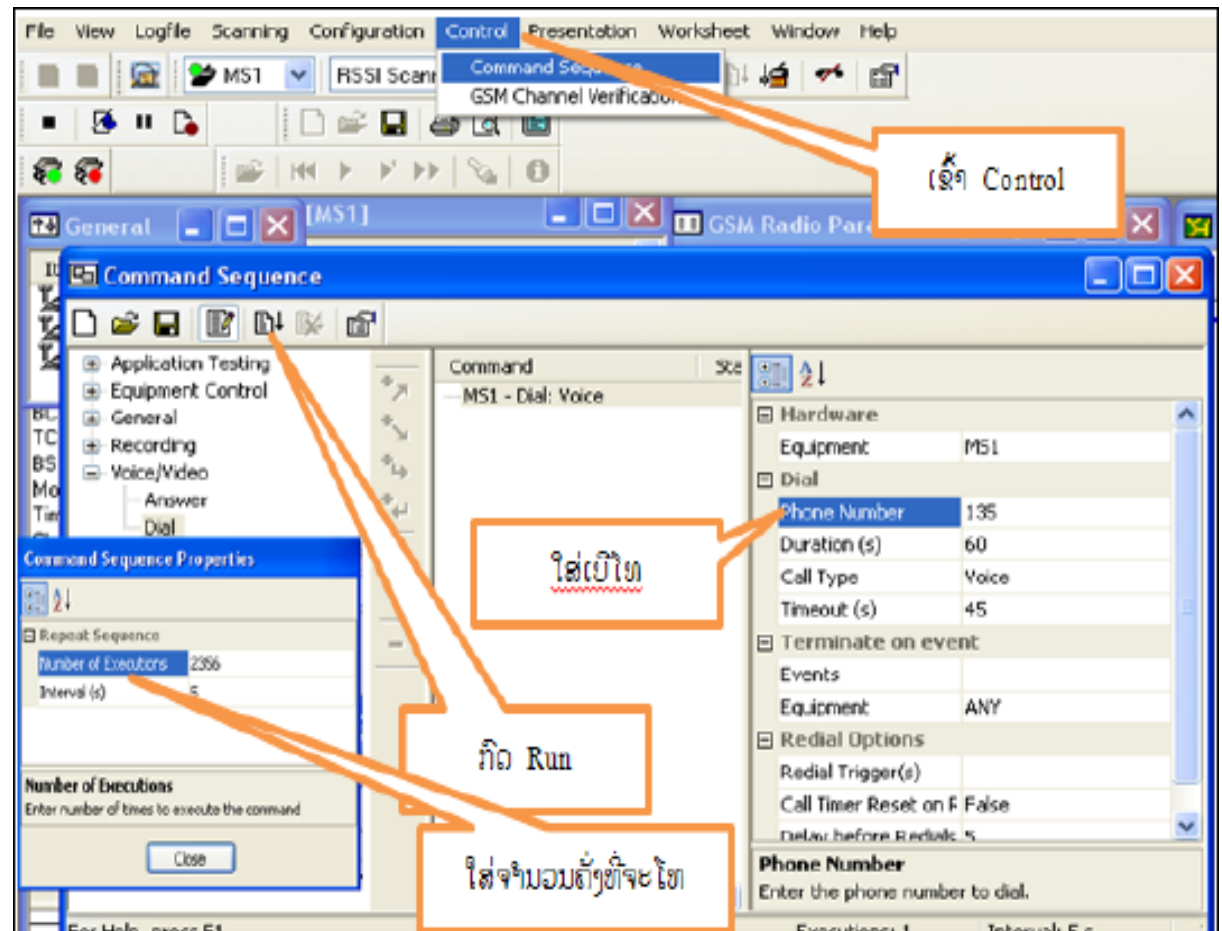
TCH ARFCN: 7

Band: 900

Time slot: 0 1 2 3 4 5 6 7

Buttons: OK, Cancel, Apply, Help

11. Setting Auto calling.

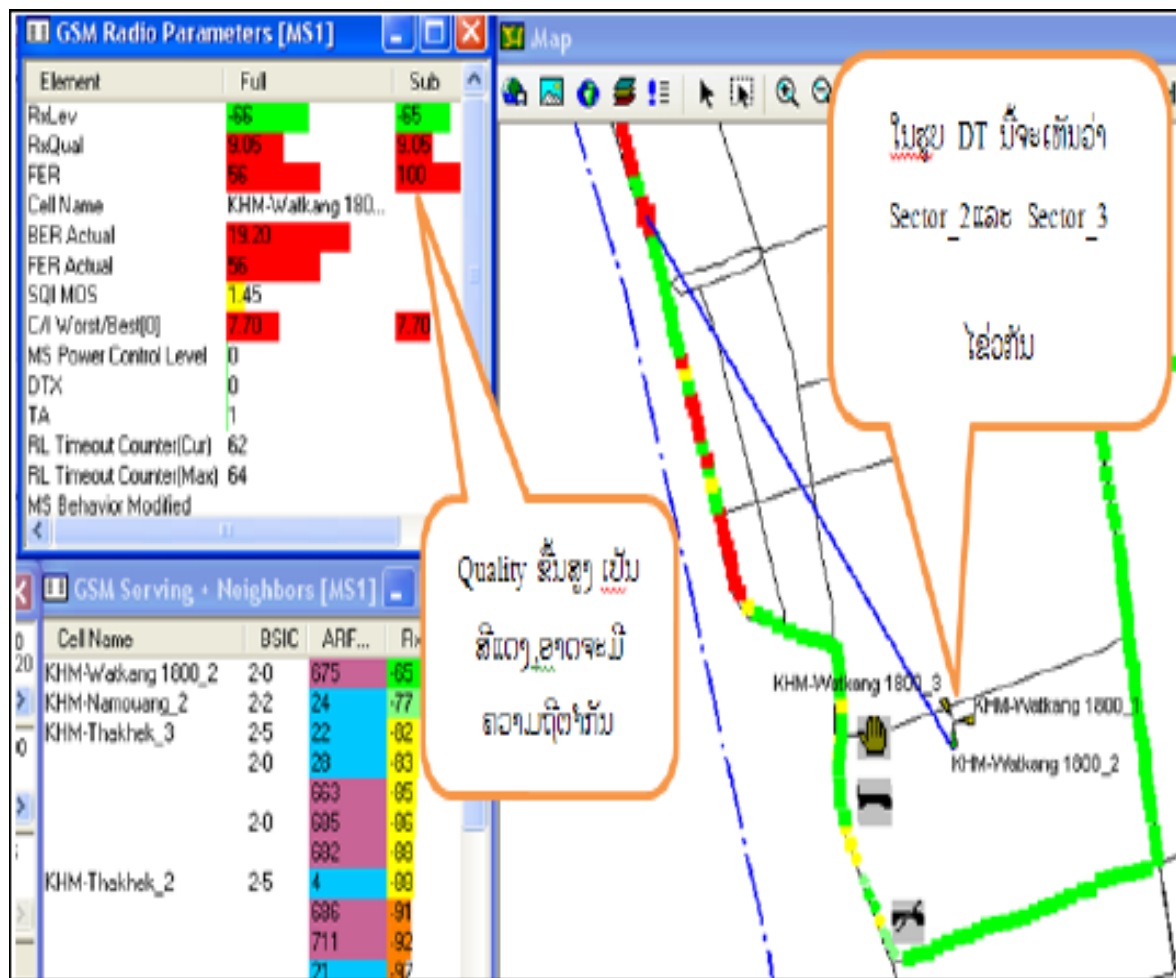


ພາກທີ 3

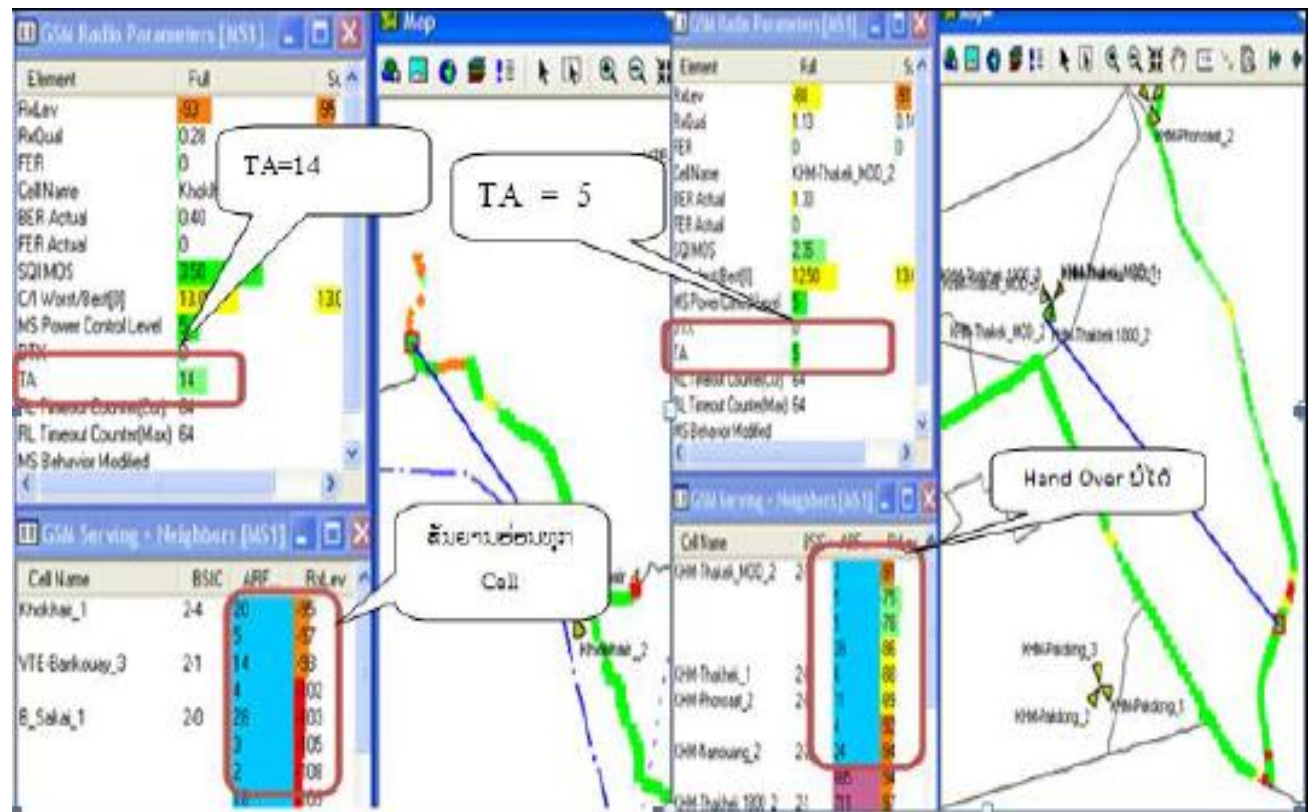
ພື້ນຖານການວິເຄາະເພື່ອຊອກຫາບັນຫາ ແລະ ແກ້ໄຂບັນຫາ



1. ການກວດເຊັກທິດທາງອັງແຕນ.



2. ການກວດກາສັນຍານອ່ອນ.



3.ການວິເຄາະການເກີດ Call drop.

The screenshot displays the GSM software interface with two main windows: 'GSM Radio Parameters [MS1]' and 'GSM Serving + Neighbors [MS1]'. The 'Radio Parameters' window shows various metrics for 'KHM-Phonaaat_2', with several values highlighted in red, indicating poor performance. The 'Neighbors' window shows a list of neighboring cells with their respective parameters.

The 'GSM Radio Parameters [MS1]' window contains the following data:

Element	Full	St...
RxLev	95	94
RxQual	10/10	10/1
FER	92	100
Cell Name	KHM-Phonaaat_2	
BER Actual	20/10	
FER Actual	92	
SQI MOS	1,20	
C/I Worst/Best[0]	3,00	3,50
MS Power Control Level	5	
DTX	0	
TA	12	
RL Timeout Counter(Cur)	5	
RL Timeout Counter(Max)	64	
MS Behavior Modified		

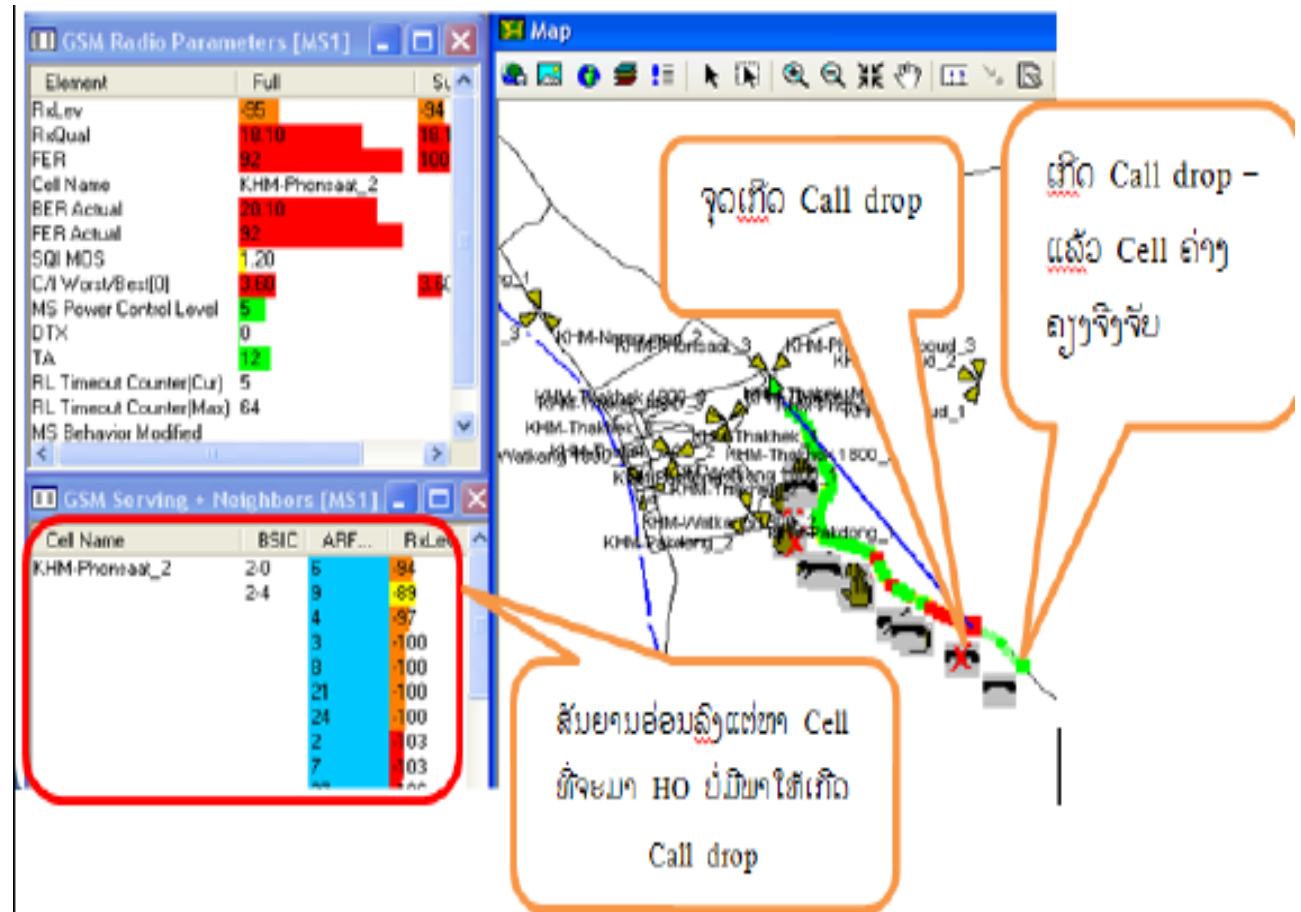
The 'GSM Serving + Neighbors [MS1]' window shows the following data:

Cell Name	BSIC	ARF...	RxLev
KHM-Phonaaat_2	2-0	5	94
	2-4	9	89
		4	97
		3	100
		8	100
		21	100
		24	100
		2	103
		7	103

The 'Map' window shows a network diagram with several cells and a path highlighted in green and red. Annotations in orange callouts provide additional context:

- ຈຸດເກີດ Call drop**: A point where a call drop occurred.
- ເກີດ Call drop - ແລ້ວ Cell ຄ່າງ ຄຽງຈິງຈັບ**: A call drop occurred, followed by the mobile device moving to a neighboring cell.
- ສັນຍານອ່ອນລົງແຕ່ຫາ Cell ທີ່ຈະມາ HO ບໍ່ມີພາໃຫ້ເກີດ Call drop**: The signal strength drops but the handover to the next cell is successful, preventing a call drop.

4. ການກວດກາການ Handover fail.



5.ການ Test Speed Data ຂອງ 2G.

ໃນການນຳໃຊ້ Data ໃນລະບົບ 2G ຈະມີ 2 ແບບ ຄື: GPRS, EDGE ,
ໃນເນັດເວີກ 2G ETL ຈະໃຊ້ຢູ່ 3 vendors
ASB, ZTE,HUAWEI. ໃນນີ້ສຳລັບ ZTE,HUAWEI ແມ່ນໃຊ້
EDGE, ມີແຕ່ສະຖານີທີ່ເປັນຂອງ ASB ຍັງໃຊ້ເປັນ GPRS ຢູ່
ເຊິ່ງ Speed data ຈະຕ່າງກັນຄື:

EDGE= DL=100Kbs, UL=50Kbs.

GPRS= DL=60Kbs, UL= 30Kbs

ສຳລັບໂປແກຣມ ກວດເຊັກ Speed ອາດຈະໃຊ້ Net PerSec ກໍໄດ້.

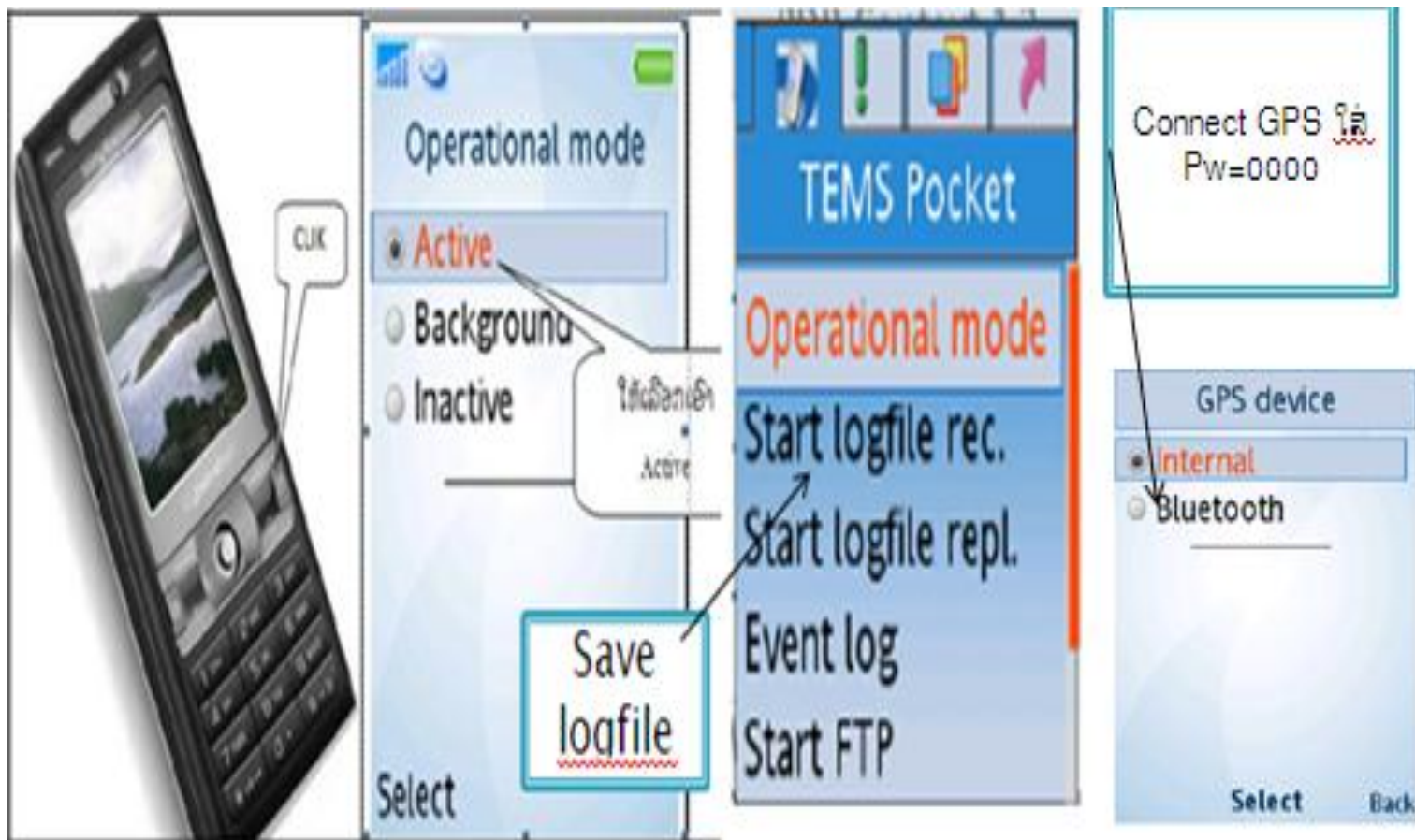


ພາກທີ 4

ຜຶ້ນຖານການນຳໃຊ້ TEMS Pocket



1. ການເປີດ Pocket.



2. ໜ້າຕ່າງ ໃນ TEMS 1.1 ຮອດ 1.5.

The image shows a grid of six screenshots from the TEMS 1.1 software interface, with annotations in Lao explaining various features and data points.

- W/G Cells 1.1:** A table showing cell parameters. Annotations point to:
 - ຄວາມຕື່ (Signal strength): points to the -90, -95, -55, -70, -72, -55 values.
 - BSIC: points to the 13, 13, 20, 20, 13, 25 values.
 - RxLvl: points to the 13, 13, 20, 20, 13, 25 values.
- PDP Context 1.2:** Shows network context details. An annotation points to the 'Lock GSM Cell' option in the 'Dataview actions' menu, with the note 'ໃຊ້ Lock ຄວາມຕື່' (Use Lock signal strength).
- MM/GMM 1.3:** Shows mobile management data. An annotation points to the 'Update' button, with the note 'ຂໍ້ມູນ Location Update' (Location Update data).
- Time log 1.4:** Shows a log of network events. An annotation points to the 'Select' button, with the note 'ຂໍ້ມູນຂອງ Packet' (Packet data).
- GPS 1.5:** Shows GPS location data. An annotation points to the 'Location' field, with the note 'Location ຂໍ້ມູນ GPS' (GPS data location).
- GPS 1.5 (continued):** An annotation points to the 'Speed' field, with the note 'ການສະແດງເວລາຕ່າງໆ' (Showing time intervals).

3. ໜ້າຕ່າງ 2.1 ຮອດ 2.3.

WCDMA Cells 2.1

S	10787	192	-88	-7	.
M	10787	24	-88	-6	.
M	10787	361	-96	-13	.
M	10787	193	-102	-19	.

WCDMA Channel 2.2

7.19	6.09	-10	.
1	1	CELL_DCH	.
9	DCH U/D	.	5150
8	DCH U/D	1	4050
31	DCH U/D	1	3700
10	DCH U/D	.	3000

WCDMA Data 2.3

7.19	5.94	-16	.
1	1	CELL_DCH	.
DRLC:	90	0	220K
DTx:	1617	0	308K
URLC:	108	0	105K
UTx:	103	.	125K

WCDMA Cells 2.1 (Serving Cell)

W	10787	192	-83	1
240	05	15	15	660

WCDMA Channel 2.2 (Serving Cell)

W	10787	24	-82	1
240	05	15	.	.

WCDMA Data 2.3 (Serving Cell)

W	10787	192	-81	1
240	05	15	.	.

Callouts:

- RxLv:** ຂໍ້ມູນ GCI
- Serving Cell:** ຕໍາລາສອບ
- Uplink / Downlink:** ຕໍາລາສອບ Uplink / Downlink

4. ໜ້າຕ່າງ 3.1 ຮອດ 3.3.

ສອມຕີ, BSIC, RxLv
 ສອມຕີ, LAC, CI, RxLv
 BCCH, RxLv
 TCH

ໃຊ້ Lock ສອມຕີ
 ໃຊ້ອ່າ ຊື່ເຕັມ ແລະ ສອມຕີຂອງຕ່າງໆ, ເຊິ່ງແຕ່ລະ Data view ຈະມີ ໃຫ້ໃຊ້

GSM Cells 3.1				GSM Cell id 3.2				GSM BA List 3.3				GSM Cells 3.1						
8	13	25	-53	0	58	58	0	13	42c	F47	-54	0	13	25	-53	0	56	56
	13	-	-53	-	-	-		13	42c	F47	-54		13	-	-53	-	-	-
	20	20	-69	+0	42	42		20	42c	F48	-71		35	20	-70	+0	41	41
	41c	70	-71	+0	40	40		656	-	-	-		20	20	-71	+0	40	40
	35	20	-	-	37	37		656	42c	35c	-73		656	21	-74	+0	37	37
	41c	70	-73	+0	38	38		15	42c	1190	-76							
	10	22	-81	+0	30	30		10	42c	1190	-81							
	33	6	-	-	-	-		33	6	9	-							
	13	25	-53		1			13	25	-54		1						
	240	01	42c	-	F47			240	01	42c	-	F47						

Calls More Calls More Calls More Select Select

5. ໜ້າຕ່າງ 4.1 ຮອດ 4.4.

Protocol	BCCH	TCH	Time slot	TA	TCH ເບີ	Half Rate
GSM Serving Cell 41	B 13 25 -41	-41	1 27 4 0 23 20/20	95 D: 0	23 3 1 0	240 01 42C . FAT
GPRS Data 42	B 13 25 -53	-53	58 . . .	DLLC: 544 0 348618	240 01 42C . FAT	
GPRS Info 43	B 13 25 -55	-55	56 . . .	DL: . 16	240 01 42C . FAT	
GSM CI Info 44	13 25 0	25 0			240 01 42C . FAT	
GSM AMR 45	B 884 50 -100	-100	10.2:100 10.2:100	6.70: 0 6.70: 0	240 98 58 . FAT	

ຈຸດທີ່ສໍາຄັນໃນການເບິ່ງເວລາໃຊ້ Pocket ແມ່ນ Quality ຖ້າມີຄ່າກາຍ 5 – 7 ແມ່ນ Quality ບໍ່ດີ.

6. ໜ້າຕ່າງ ແລະ ຄວາມໝາຍທີ່ສະແດງໃນ TEMS Pocket.

No.	View Name	Description
1.1	W/G Cells	Combines WCDMA Cells (2.1) and GSM Cells (3.1) views into a dual mode view.
1.2	PDP Context	Displays PDP addresses and PDP context settings for each address, including NSAPI and APN.
1.3	MM/GMM	Displays identities common to WCDMA and GSM, such as TMSI, P-TMSI, and CGI of last registered network.
1.4	Time Log	Displays time spent by the phone in various states since last power-on.
1.5	GPS	Displays essential GPS data: latitude and longitude, altitude and speed, number of satellites, fix quality, time and date. Note: This view is only available if TEMS Pocket has the GPS option installed.
2.1	WCDMA Cells	Displays UARFCN, cell status, scrambling code, RSCP, Ec/No, and path loss for each cell in active set and monitored/detected neighbor sets.
2.2	WCDMA Channel	Displays SIR and SIR target, power control information, RRC state, and information on transport channels used.
2.3	WCDMA Data	Presents SIR and SIR target, power control information, RRC state, and information on uplink and downlink RLC and transport channel performance.
–	WCDMA WAP browser view	Displays a subset of the WCDMA Data view (2.3) during WAP browsing.

3.1	GSM Cells	Displays ARFCN, BSIC, RxLev, C1/C31, and C2/C32 for the serving cell and each neighbor. Also presents system information data for cell access, selection, and location.
3.2	GSM Cell Id	Displays ARFCN, LAC, CI, and RxLev for the serving cell and each neighbor. Also presents system information data for cell access, selection, and location.
3.3	GSM BA List	Presents the GSM BA neighbor list as received from the network and shows which BCCH ARFCN the list was received from.
4.1	GSM Serving Cell	Presents system information data on serving cell depending on mode (idle/connected). Note: TMSI, P-TMSI, and TLLI have been moved to the MM/GMM data view.
4.2	GPRS Data	Displays traffic channel ARFCN, timeslots and coding schemes used, and LLC and RLC performance on uplink and downlink.
4.3	GPRS Info	Displays traffic channel ARFCN, timeslots and coding schemes used, and vital GPRS/EGPRS configuration parameters
4.4	GSM C/I Info	Displays C/I information for the most frequently utilized timeslot for each ARFCN in use.
4.5	GSM AMR	Displays GSM logical channel information, AMR codec selected on uplink and downlink, and statistics on AMR codec utilization.

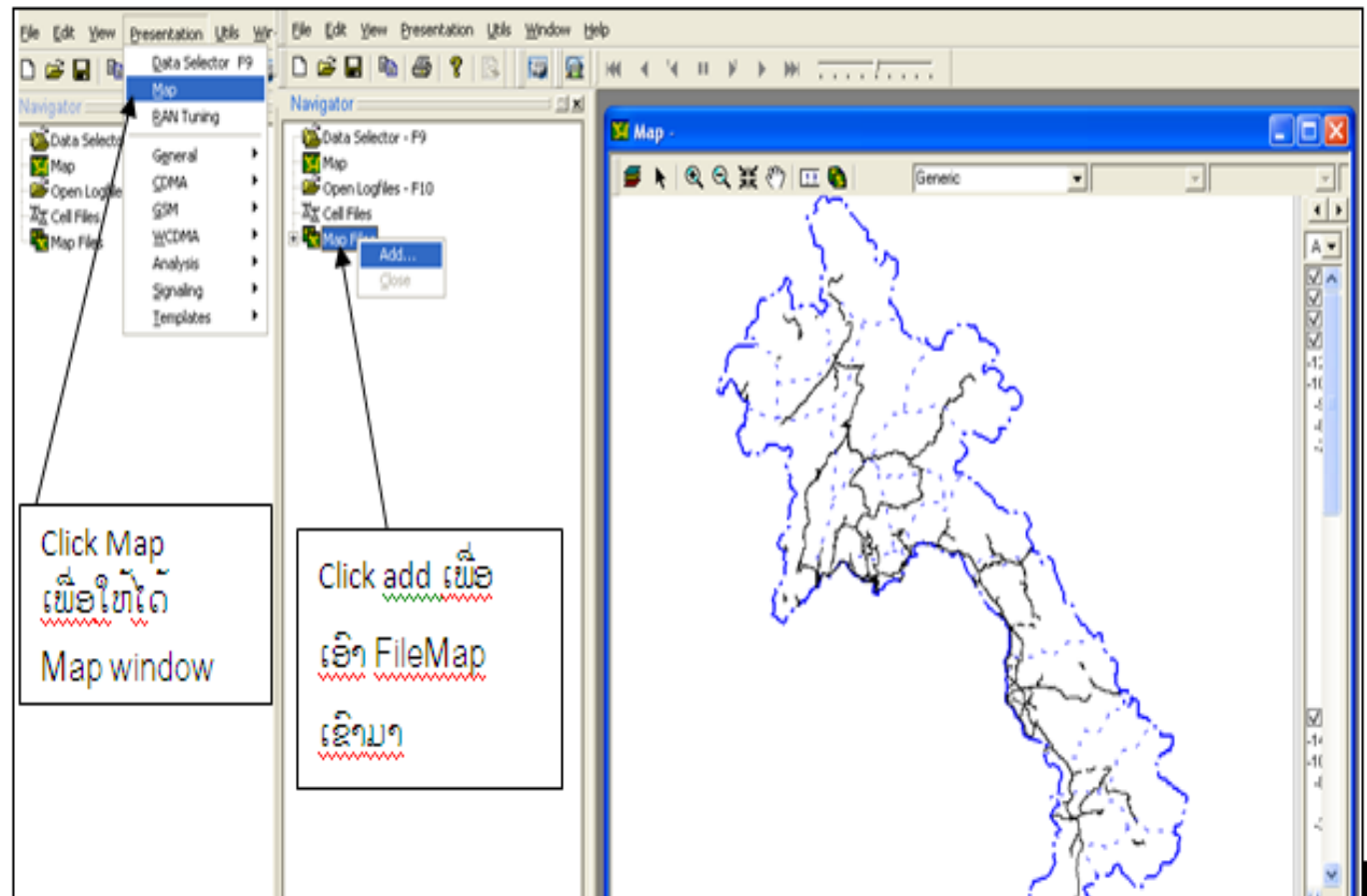
ພາກທີ 5. ຜື້ນຖານການນຳໃຊ້ TEMS Investigation Route Analysis.

I. Setting.

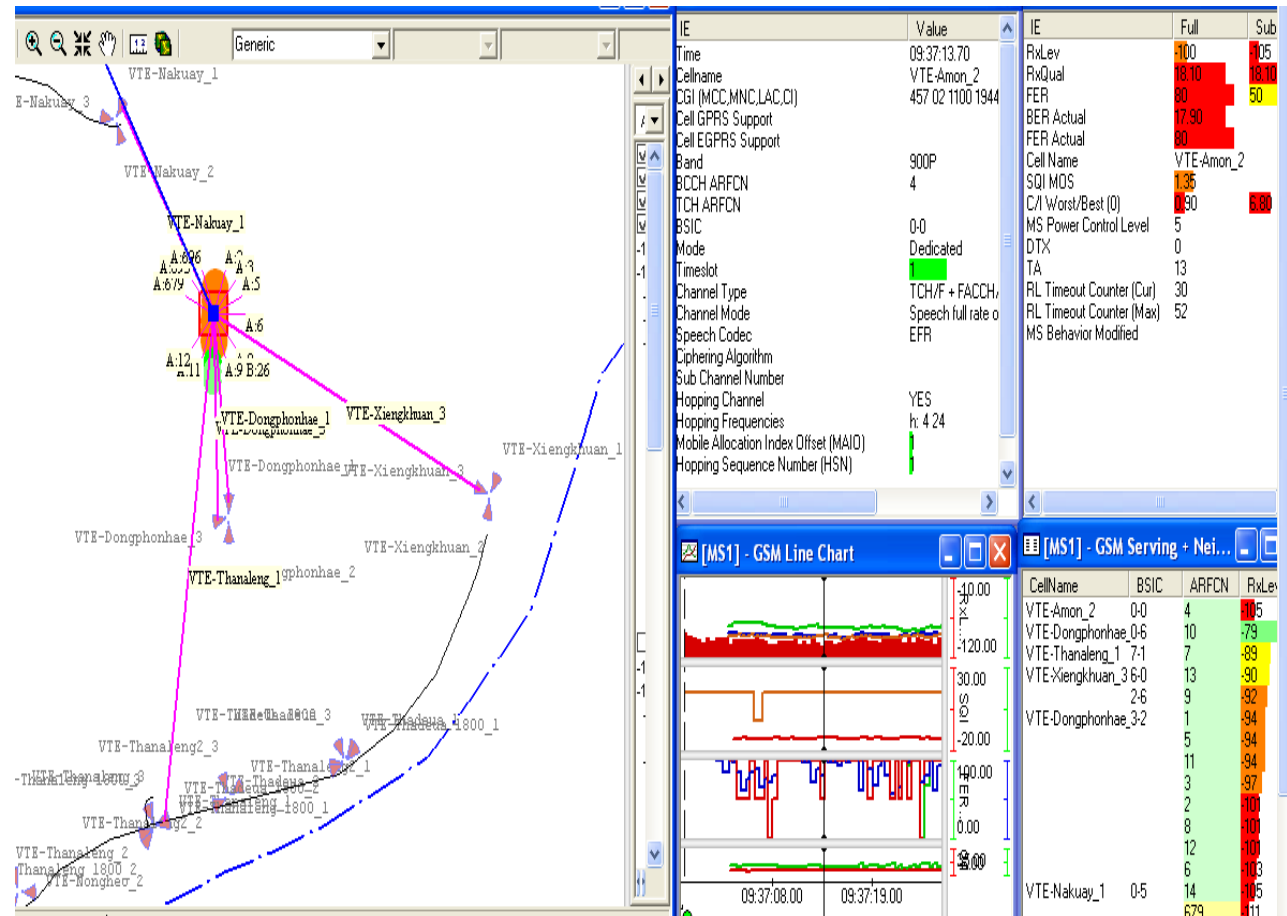
1. Map Setting.
2. Window Setting.
3. Site file Setting.
4. Import Setting.



1.ການ Setting Map.

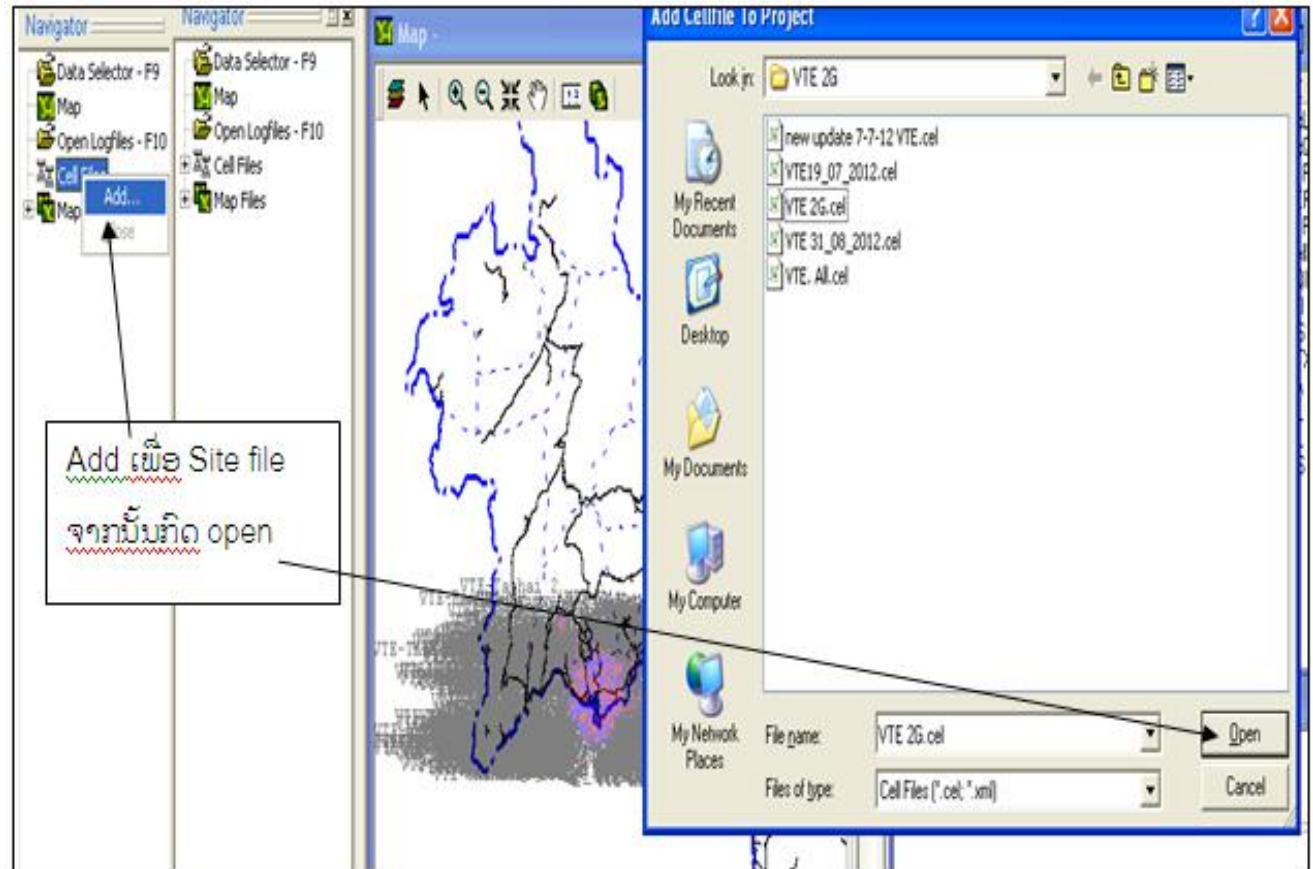


2.ໜ້າຕ່າງທີ່ຈະເອົາມາວິເຄາະ.



3. ການເອົາສະຖານີເຂົ້າໃນ Map.

ການເອົາສະຖານີເຂົ້າໃນ Map ມີຂັ້ນຕອນດັ່ງນີ້: ເຊິ່ງ cell file, click ຂວາ, ເລືອກ Add ເລືອກເອົາ Site file ດັ່ງຮູບລຸ່ມນີ້:



4.ການເອົາ Logfile ເຂົ້າມາເພື່ອວິເຄາະ.

Click ຂວາໃສ່
Open logfile
click Add

ເລືອກ Logfile
ຈາກນັ້ນກົດ
Open

ຈາກນັ້ນ ດຶງ Logfile ມາໃສ່ Map ຈາກນັ້ນເອົາເມາສ click ໃສ່ຈຸດທີ່ຕ້ອງວິເຄາະເບິ່ງ.

Name	Size	Type	Date
export		File Folder	10/10/
3g dangdok to thatlung.log	3,900 KB	Text Document	9/19/1
3gpp.log	10,673 KB	Text Document	9/19/1
103 hospital.log	38,369 KB	Text Document	9/19/1
103 interference band.log	2,168 KB	Text Document	9/20/1
Anon in 450 .log	251 KB	Text Document	8/25/1
Anon Nongrieng.log	3,120 KB	Text Document	9/11/1
ASB HO HW2.log	1,671 KB	Text Document	9/6/2
ASB HO HW1.log	1,011 KB	Text Document	9/6/2
asianMarket Mall .log	6,514 KB	Text Document	9/25/1
B FY HO Congxuan.log	7,907 KB	Text Document	9/6/2
B Hom kankong.log	23,632 KB	Text Document	8/25/1
B kauy-pearlad.log	33,892 KB	Text Document	9/15/1
B May Peerlad log2.log	36,770 KB	Text Document	9/15/1

5. ການວິເຄາະໂດຍໃຊ້ Route Analysis

5.1 ການວິເຄາະເບິ່ງຄວາມຖີ່ຕໍາກັນ.

Generic

VTE-Nongphaya_3 VTE-Nongphaya_1 VTE-Nongphaya_2 VTE-Nongphaya_4 VTE-Nongphaya_5 VTE-Nongphaya_6 VTE-Nongphaya_7 VTE-Nongphaya_8 VTE-Nongphaya_9 VTE-Nongphaya_10 VTE-Nongphaya_11 VTE-Nongphaya_12 VTE-Nongphaya_13 VTE-Nongphaya_14 VTE-Nongphaya_15 VTE-Nongphaya_16 VTE-Nongphaya_17 VTE-Nongphaya_18 VTE-Nongphaya_19 VTE-Nongphaya_20 VTE-Nongphaya_21 VTE-Nongphaya_22 VTE-Nongphaya_23 VTE-Nongphaya_24 VTE-Nongphaya_25 VTE-Nongphaya_26 VTE-Nongphaya_27 VTE-Nongphaya_28 VTE-Nongphaya_29 VTE-Nongphaya_30 VTE-Nongphaya_31 VTE-Nongphaya_32 VTE-Nongphaya_33 VTE-Nongphaya_34 VTE-Nongphaya_35 VTE-Nongphaya_36 VTE-Nongphaya_37 VTE-Nongphaya_38 VTE-Nongphaya_39 VTE-Nongphaya_40 VTE-Nongphaya_41 VTE-Nongphaya_42 VTE-Nongphaya_43 VTE-Nongphaya_44 VTE-Nongphaya_45 VTE-Nongphaya_46 VTE-Nongphaya_47 VTE-Nongphaya_48 VTE-Nongphaya_49 VTE-Nongphaya_50 VTE-Nongphaya_51 VTE-Nongphaya_52 VTE-Nongphaya_53 VTE-Nongphaya_54 VTE-Nongphaya_55 VTE-Nongphaya_56 VTE-Nongphaya_57 VTE-Nongphaya_58 VTE-Nongphaya_59 VTE-Nongphaya_60 VTE-Nongphaya_61 VTE-Nongphaya_62 VTE-Nongphaya_63 VTE-Nongphaya_64 VTE-Nongphaya_65 VTE-Nongphaya_66 VTE-Nongphaya_67 VTE-Nongphaya_68 VTE-Nongphaya_69 VTE-Nongphaya_70 VTE-Nongphaya_71 VTE-Nongphaya_72 VTE-Nongphaya_73 VTE-Nongphaya_74 VTE-Nongphaya_75 VTE-Nongphaya_76 VTE-Nongphaya_77 VTE-Nongphaya_78 VTE-Nongphaya_79 VTE-Nongphaya_80 VTE-Nongphaya_81 VTE-Nongphaya_82 VTE-Nongphaya_83 VTE-Nongphaya_84 VTE-Nongphaya_85 VTE-Nongphaya_86 VTE-Nongphaya_87 VTE-Nongphaya_88 VTE-Nongphaya_89 VTE-Nongphaya_90 VTE-Nongphaya_91 VTE-Nongphaya_92 VTE-Nongphaya_93 VTE-Nongphaya_94 VTE-Nongphaya_95 VTE-Nongphaya_96 VTE-Nongphaya_97 VTE-Nongphaya_98 VTE-Nongphaya_99 VTE-Nongphaya_100

จุดที่ 1

เส้นสีฟ้าแม่ Cell ที่จับ (Serving)

เส้นสีปัดแม่ Serving Cell

ในนี้ F7 แม่ วนะพายบ่ติ. ถ้า C/I เป็นสีแดง

ในนี้เอาตจะมั่งขะเดินไปที่ 1: ความถี่ต่ำกัน 2: ชาติแอมมีขึ้นเขา.

IE	Value	IE	Full	Sub
Time	13 14 03.09	RxFer	83	80
Cellname	VTE-Nongphaya_2	RxFerQual	88	81
CGI (MCC,MNC,LAC,CI)	457 02 1100 1362	FER	88	81
CellEGPRS Support	YES	BER Actual	19	19
CellEGPRS Support	NO	FER Actual	88	81
Band	900P	Cell Name	VTE-Nongpha	
BCCH ARFCN	7	SQI MOS	1.0	1.0
TCH ARFCN		C/I Worst/Best (dB)	50	88
BSIC	5-2	MS Power Control Level	5	
Mode	Dedicated	DTX	0	
Timeslot		RL Timeout Counter (Cur)	3	
Channel Type	TCH/F + FACCH/F and SAI	RL Timeout Counter (Max)	64	
Channel Mode	Speech full rate or half rate	MS Behavior Modified		

CellName	B...	ARFCN	RxFer	ARFCN	RxFer (d...	C/I (dB)
VTE-Nongphaya_2	5-2	7	-80	7	-75	80
VTE-Nongphaya_2	5-3	7	-75	25	-85	80
VTE-Nongphaya_2	3-0	6	-79	30	-86	80
VTE-Nongphaya_2	1-0	1	-84			
VTE-Nongphaya_2	0-0	0	-85			
VTE-Nongphaya_2	9-0	9	-88			
VTE-Nongphaya_2	2-0	2	-89			
VTE-Nongphaya_2	11-0	11	-89			
VTE-Nongphaya_2	4-0	4	-90			
VTE-Nongphaya_2	683	683	-90			
VTE-Nongphaya_2	690	690	-90			
VTE-Nongphaya_2	695	695	-91			
VTE-Nongphaya_2	5-0	5	-93			
VTE-Nongphaya_2	10-0	10	-94			
VTE-Nongphaya_2	12-0	12	-97			

จุดที่ 1

IE	Value	Full	Sub
Time	13:14:03.09		
CellName	VTE Nongpaya_2		
CGI (MCC,MNC,LAC,CI)	457 02 1100 1362		
Cell GPRS Support	YES		
Cell EGPRS Support	NO		
Band	900P		
BCCH ARFCN	7		
TCH ARFCN			
BSIC	52		
Mode	Dedicated		
Timeslot			
Channel Type	TCH/F + SACCH/F and S4		
Channel Mode	Speech full rate or half rate		
Ciphering Algorithm			
Sub Channel Number			
Hopping Channel	YES		
Hopping Frequencies	h 7 25 30		
Mobile Allocation Index Offset (MAIO)			

จุดที่ 2

IE	Value	Full	Sub
Time	13:22:01.34		
CellName	VTE Nongpaya2_1		
CGI (MCC,MNC,LAC,CI)	457 02 1100 19424		
Cell GPRS Support	YES		
Cell EGPRS Support	YES		
Band	900P		
BCCH ARFCN	4		
TCH ARFCN			
BSIC	45		
Mode	Dedicated		
Timeslot			
Channel Type	SACCH/B + SACCH/CB or I		
Channel Mode	Signaling only		
Ciphering Algorithm			
Sub Channel Number			
Hopping Channel	YES		
Hopping Frequencies	h 4 17		
Mobile Allocation Index Offset (MAIO)			
Hopping Sequence Number (HSN)	20		

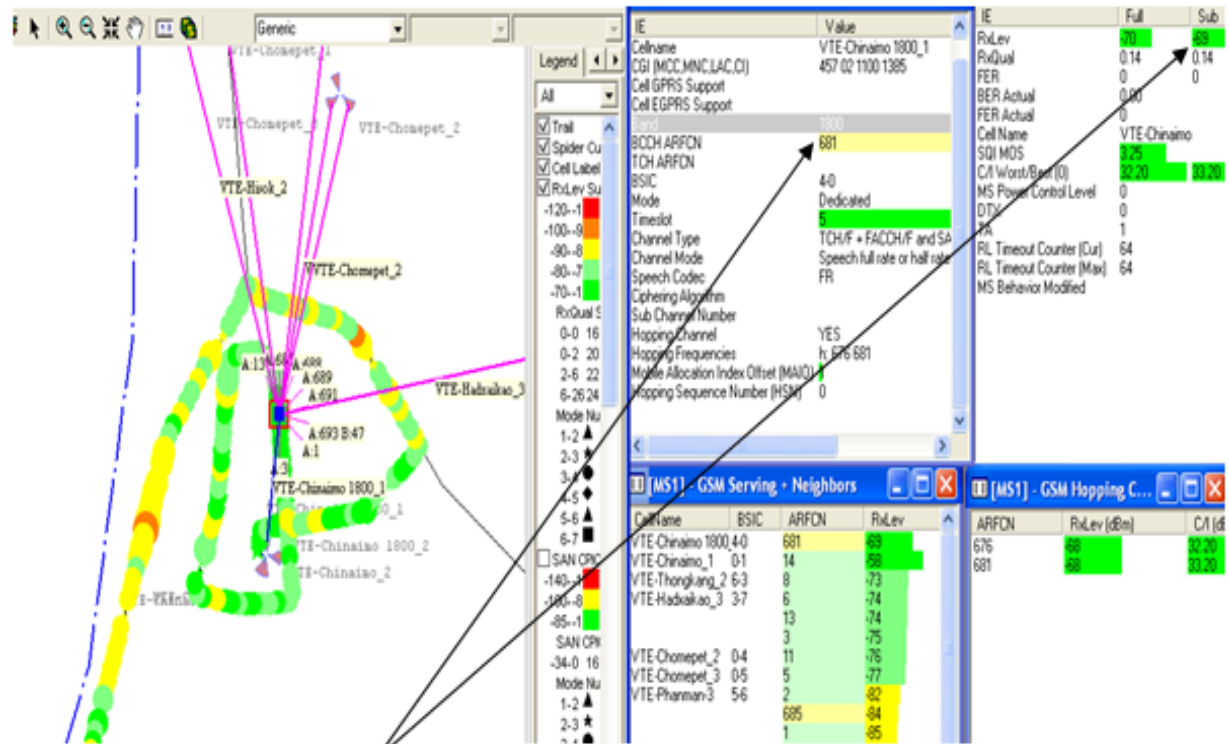
[MS1] - GSM Serving - Neighbors

CellName	B	ARFCN	RxLev
VTE Nongpaya2_1 4-5	4		-84
VTE Nongpaya2_1 4-5	4		-83
VTE Nongviengkham_3	7		-75
VTE Nongviengkham_3	7		-76
VTE Nongpaya2_1 4-5	4		-79
VTE Nongpaya2_1 4-5	4		-85
VTE Nongpaya2_1 4-5	4		-87
VTE Nongpaya2_1 4-5	4		-87
VTE Nongpaya2_1 4-5	4		-88
VTE Nongpaya2_1 4-5	4		-88

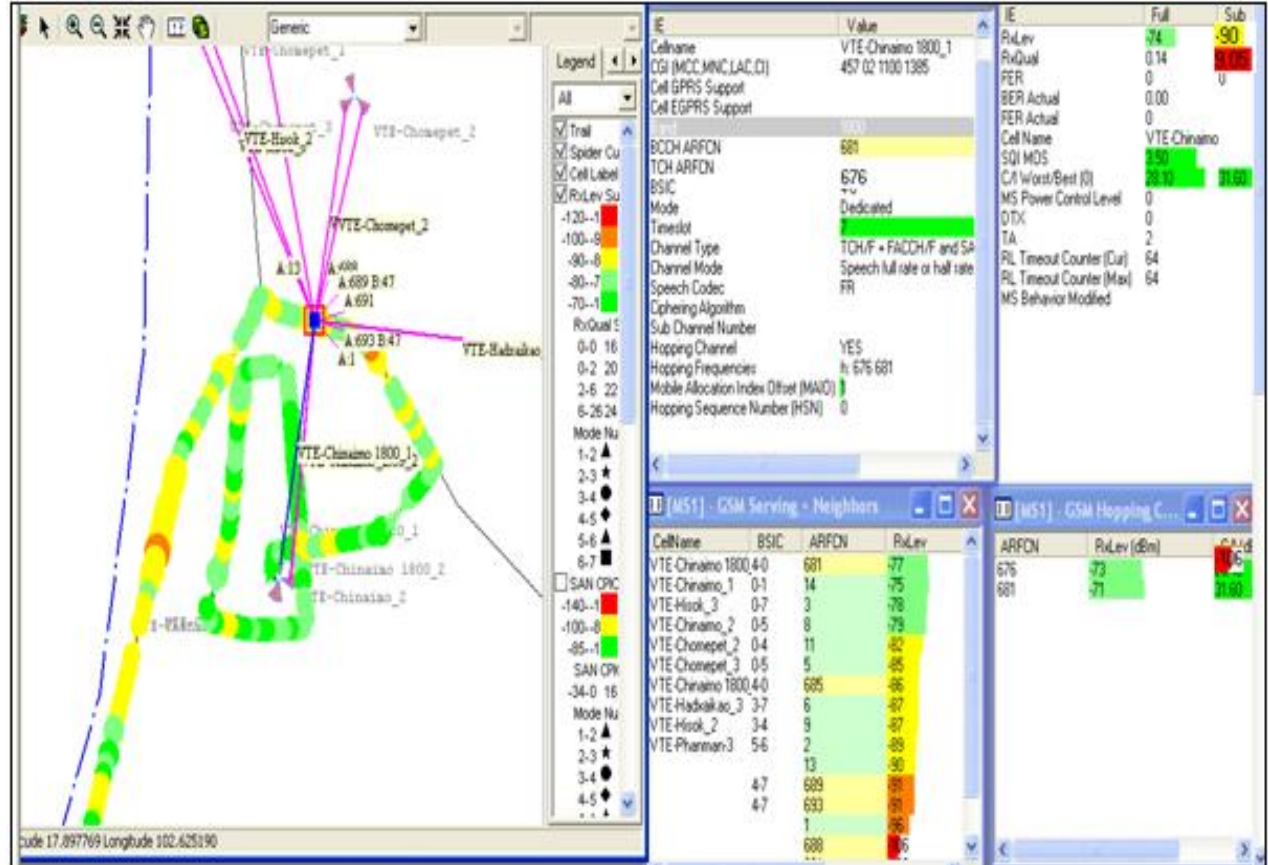
ການແກ້ໄຂກໍ່ຄື
ບ່ຳນຄວາມຖີ່ 7 ອອກ
ຈາກ Cell ໃດໜຶ່ງ

ໃນນີ້ຈະປະກົດເຫັນວ່າມີ Nongviengkham_3 ມີ F7 ຂຶ້ນມາສະນັ້ນສະຫຼຸບໄດ້
ວ່າ Nongpaya_2, Nongviengkham_3 ໃຊ້ຄວາມຖີ່ 7 ໃນພື້ນທີ່ໃກ້ກັນ

5.2.ການວິເຄາະ TRX ມີບັນຫາ.

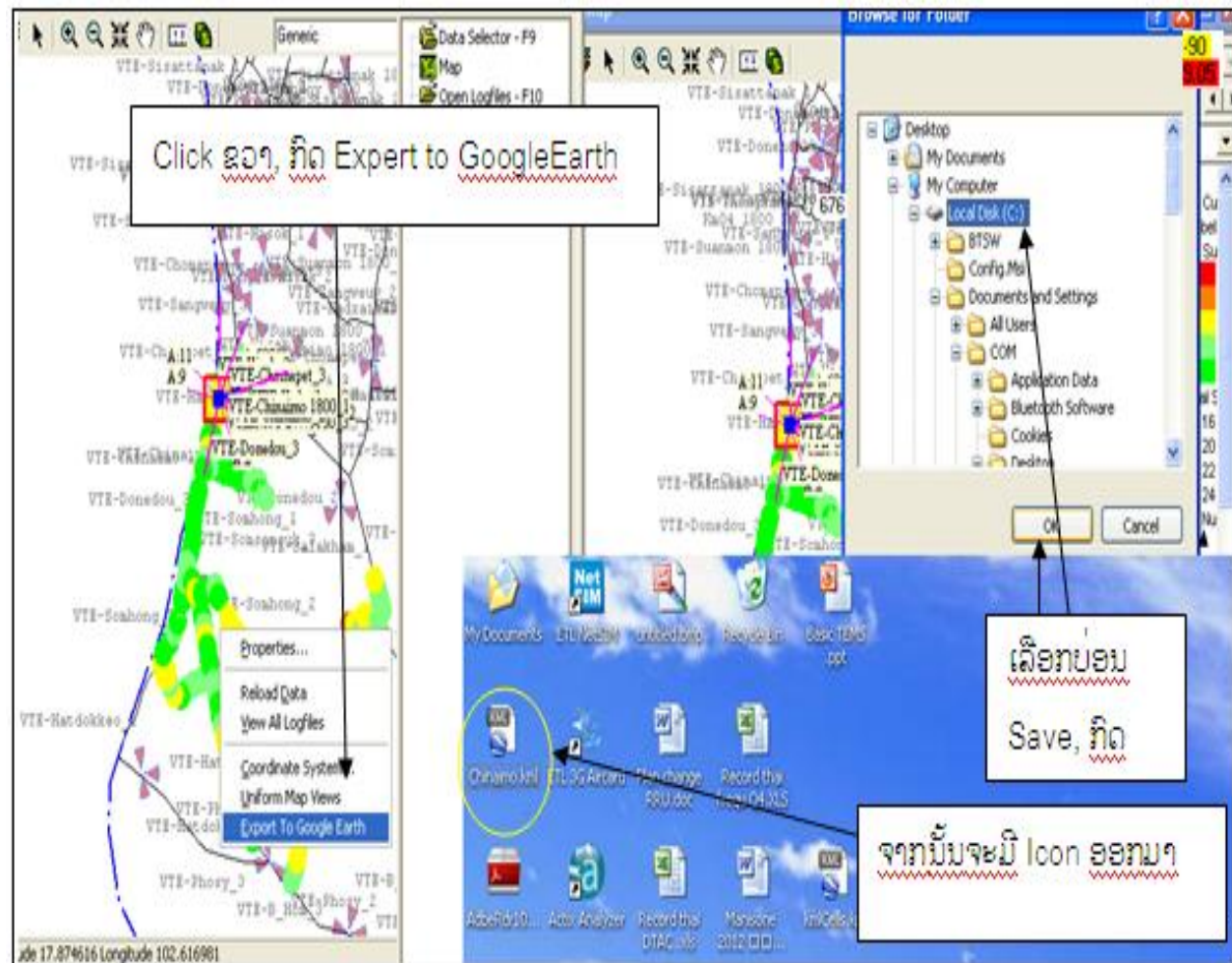


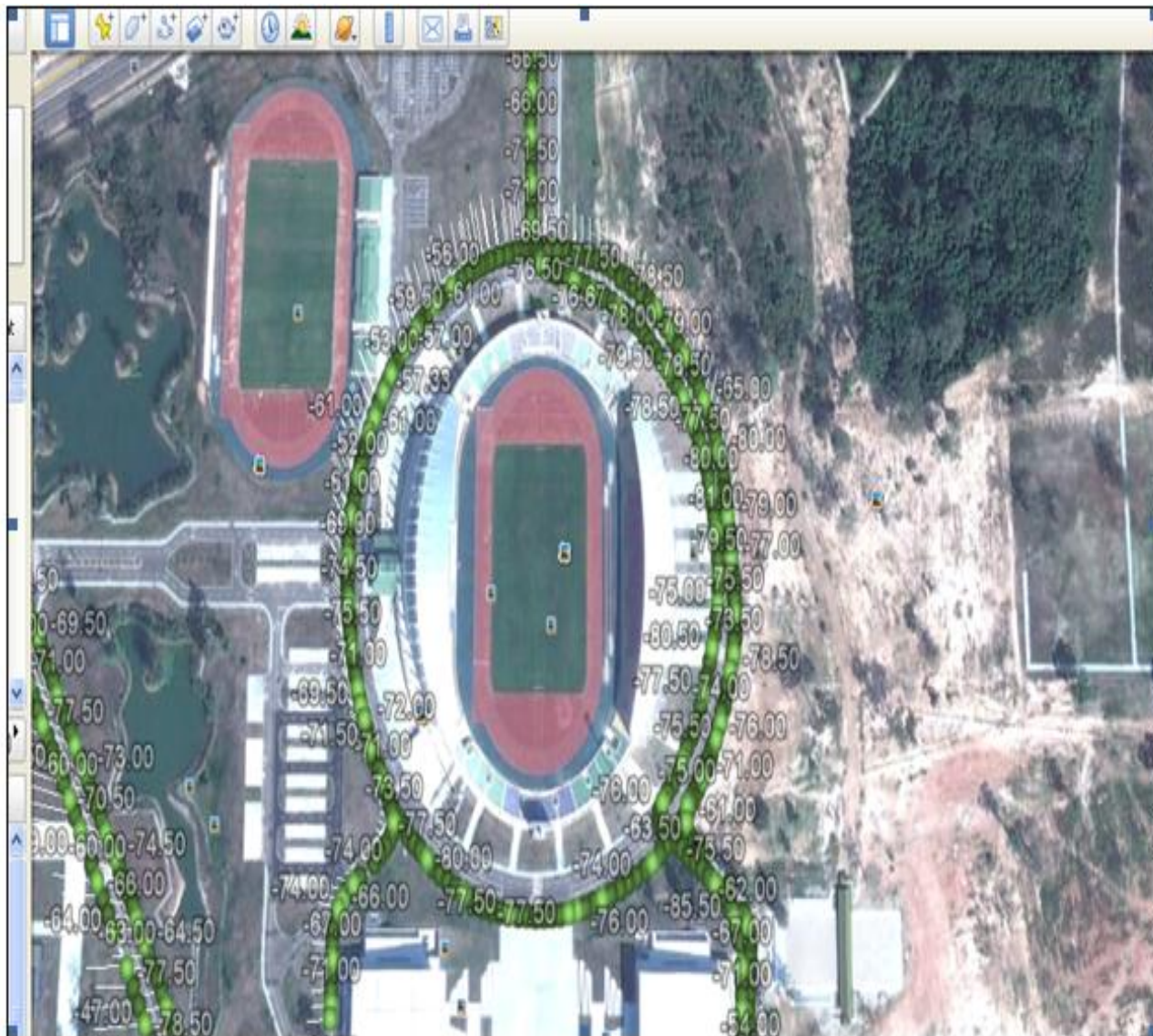
ຕົວຢ່າງທີ່ 1: ໃນເວລາໂທທໍາອິດ, ຈະຈັບໂທຢູ່ໃນ TRX ທີ່ເປັນ BCCH ຈະສັງເກດເຫັນວ່າ Quality ດີ



ຕົວຢ່າງທີ 2: ໃນນີ້ເຫັນໄດ້ວ່າເວລາຈັບ TRX ທີ່ເປັນ TCH ແລ້ວມາສັງເກດເບິ່ງຄ່າ C/I ແລະ Quality ບໍ່ດີ ຖ້າກວດກາເບິ່ງຄວາມຖີ່ ຖ້າບໍ່ມີສະແດງວ່າ TRX ມີບັນຫາອາດຢ່າງນ TRX ແລ້ວກວດຄົ້ນຖ້າ C/I ແລະ Quality ດີຂຶ້ນ ສະແດງວ່າ TRX ມີບັນຫາ

6. ການ Convert Logfile ໃສ່ Google Earth.





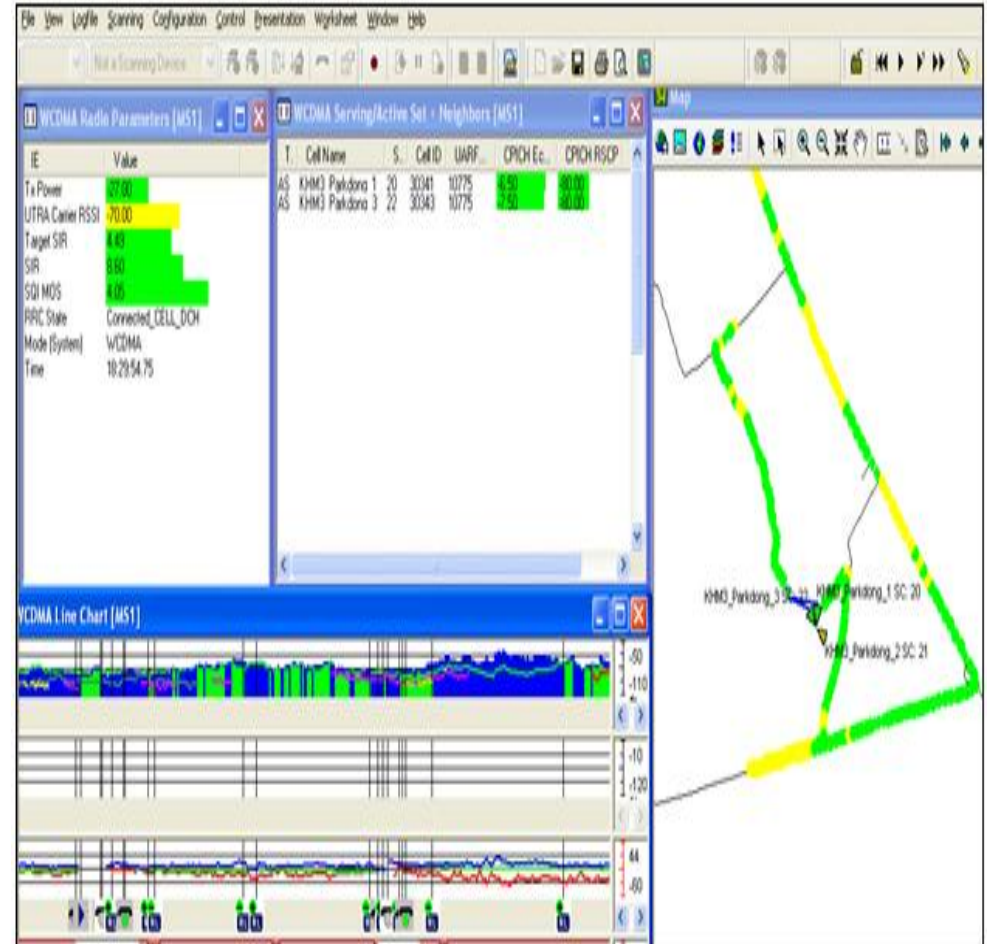
ພາກທີ 6

ພື້ນຖານການເຮັດ Driving Test 3G



1.ໜ້າຕ່າງທີ່ນຳມາເຮັດ DT 3G Voice call .

1. WCDMA Radio Parameter.
2. WCDMA Sarving/Set+ Neighbors.
- 3.WCDMA Line Chat.
4. Map.



1.1. ໜ້າຕ່າງ WCDMA Radio parameter.

IE	Value
Tx Power	-11.00
JTRA Carrier RSSI	-74.00
Target SIR	2.27
SIR	7.49
SQ MOS	3.90
RRC State	Connected_CELL_DCH
Mode (System)	WCDMA
Time	18:15:33.51

Call mode

ສັນຍານລຶບກວນ

ຄຸນນະພາບສຽງ

TX/TRX Power ຂອງ UE

1.2.WCDMA Serving/activeset+Neighbors

WCDMA Serving/Active Set + Neighbors [MS1]

T.	Cell Name	S..	Cell ID	UARF...	CPICH Ec...	CPICH RSCP
AS	KHM3 Thakhek 1	80	30071	10775	-3.00	-79.00
MN	KHM3 Thakhek 3	82		10775	-21.00	-97.00
MN	KHM3 Parkdona 3	22		10775	-24.00	-102.00
DN	KHM3 Parkdona 1	20		10775	-19.50	-96.00
DN	KHM3 Phonsaat 2	73		10775	-21.50	-97.00
DN	KHM3 Phonsaat 3	74		10775	-23.50	-101.00
DN	KHM3 Valkano 1	28		10775	-24.50	-102.00

Cell ដែលជា NB

Cell ID

SC

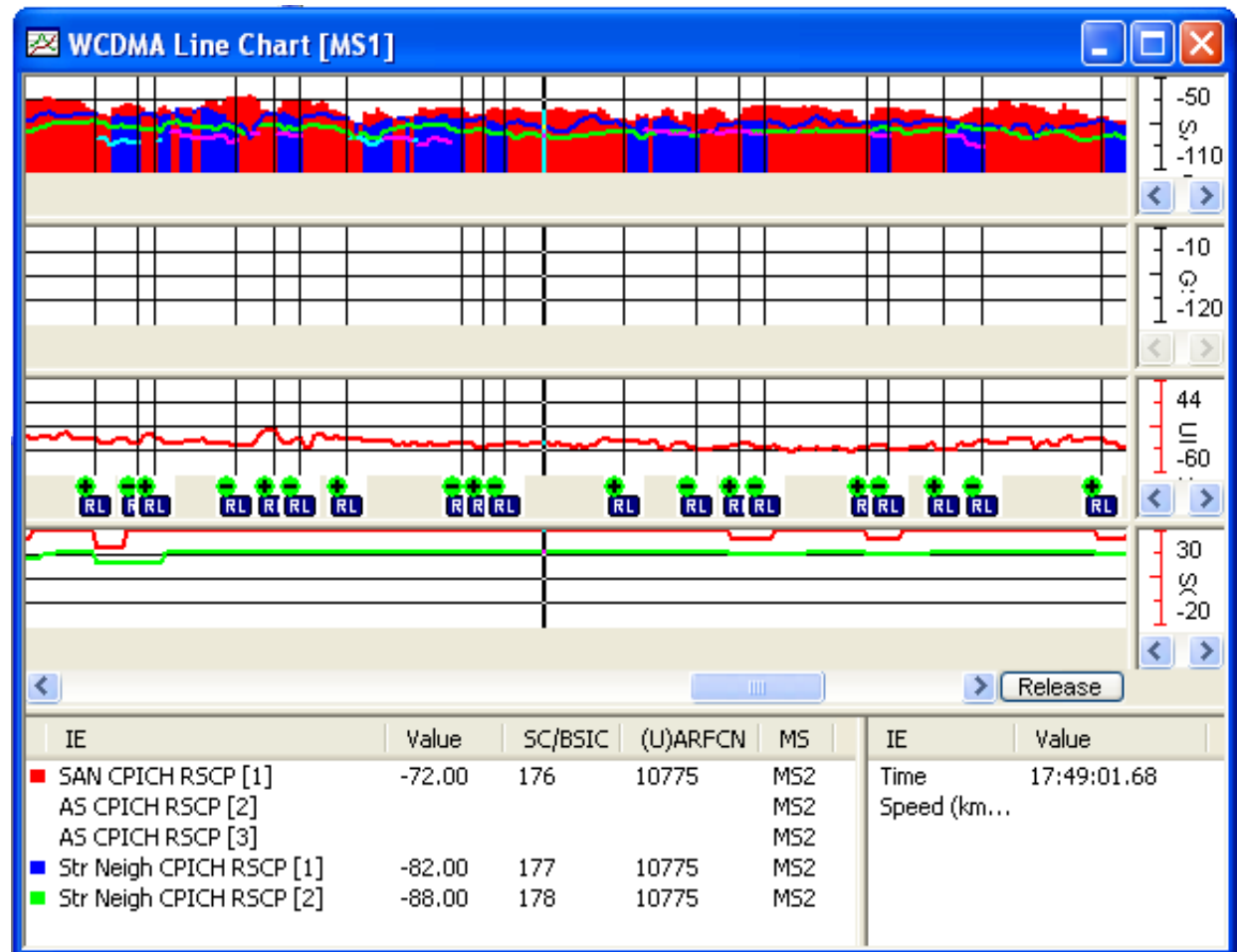
F.Chanell

លະដំណាក់កាលសីនេម៉ាស រួច ពីនាំពិចារណា

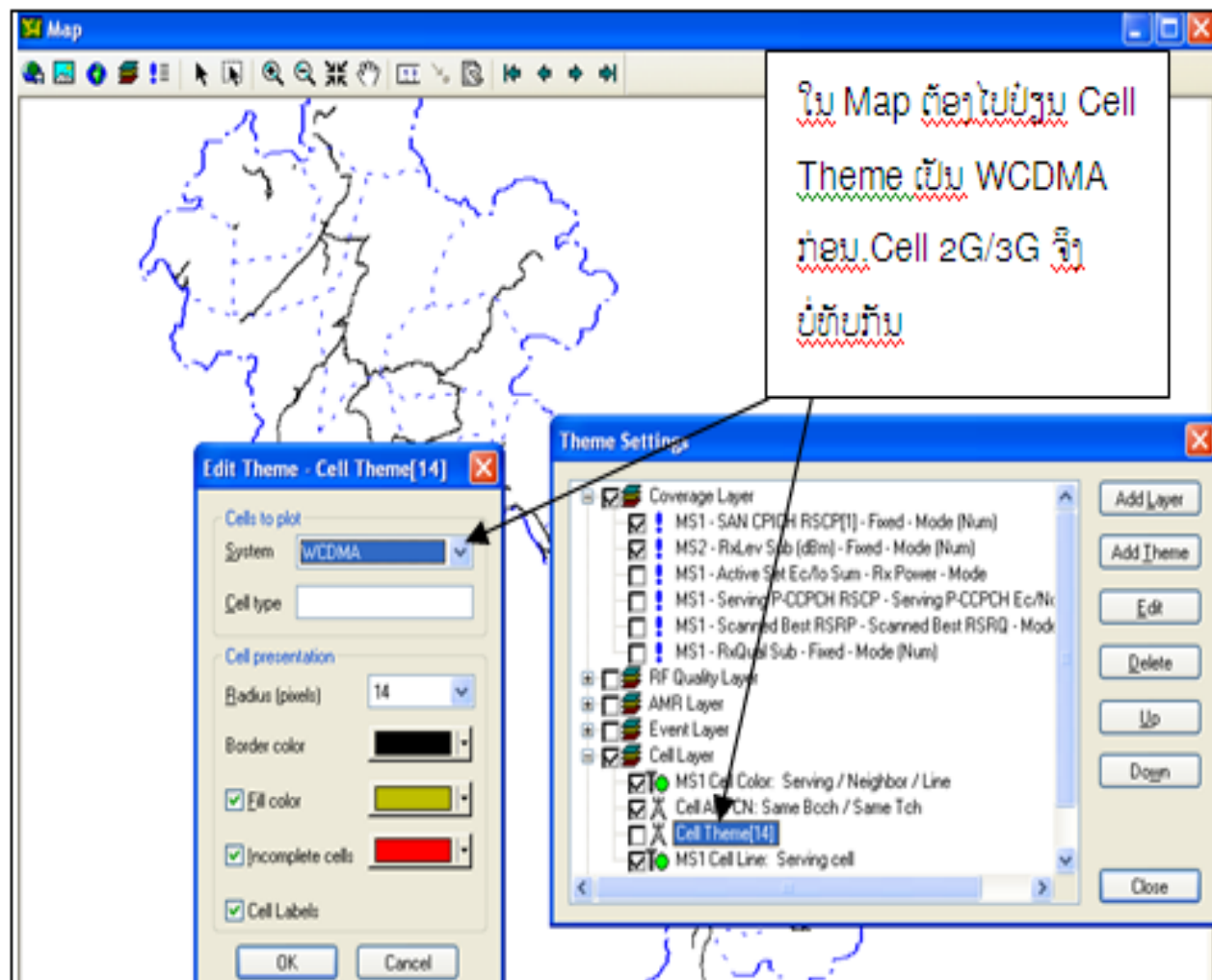
លະដំណាក់កាលសីនេម៉ាស

សរុបរយ ក្នុង ក្រុម Cell ដែល បាន រាយនាម ខាងលើ គឺជា ក្រុម ប្រព័ន្ធ NB

1.3. WCDMA Line Chart.



1.4. Map.



2. ການ Test Speed 3G.

ໃນການກວດກາ Speed ຂອງ 3G ຈະມີທັງ Upload and Dowload.
ເຊິ່ງຈະມີການ Test ຄື:

1. ການນຳໃຊ້ Air card ເພື່ອ Test Speed.

- HSDPA = High-Speed Downlink Packet Access. (Max = 14.4 Mbs)

- HSUPA = High-Speed Upnlink Packet Access. (Max= 7.8 Mbs)

2. ການກວດກາ Speed ຂອງ Data ທີ່ໃຊ້ຜ່ານມືຖື (R99).

- R99 UL (Max= 384Kbs).

- R99 DL (Max= 384Kbs).

ເຊິ່ງໃນການ Test speed ແມ່ນຂຶ້ນກັບ Capacity ຂອງອຸປະກອນທີ່ Test
ເຊິ່ງໂປຣແກຣມພື້ນຖານການ Test speed ມີຫລາຍລຸ້ນແຕ່ໃນນີ້ຂ້າພະເຈົ້າຈະຍົກ
ຕົວຢ່າງໃຫ້ 1 Program ຄື: NetPerSec ດັ່ງຮູບລຸ່ມ:

NetPerSec.exe
NetPerSec
Ziff-Davis Media, Inc.

netpersec.ini
Configuration Settings
1 KB

Shortcut to NetPerSec.exe
Shortcut
1 KB

(602 unread) - manisonesy - Yahoo! Mail - Mozilla Firefox

NetPerSec

Graph | Options | Display | About

Received: 6.0 Gbits

Current: 12.3 Mbits/s

Average: 8.6 Mbits/s

Max: 19.4 Mbits/s

24.3 Mbits/s

12.2 Mbits/s

0 bits/s

Auto scale

Sent: 286.8 Mbits

Current: 2.5 Mbits/s

Average: 1.5 Mbits/s

Max: 3.8 Mbits/s

4.8 Mbits/s

2.4 Mbits/s

0 bits/s

Auto scale

Display

Current Bar graph bits per second (bps)

Average Line graph Bytes per second (Bps)

Reset data

OK Cancel Help

Duble clic

ຈະໄດ້ໝາ
ຕາງອອກມາ

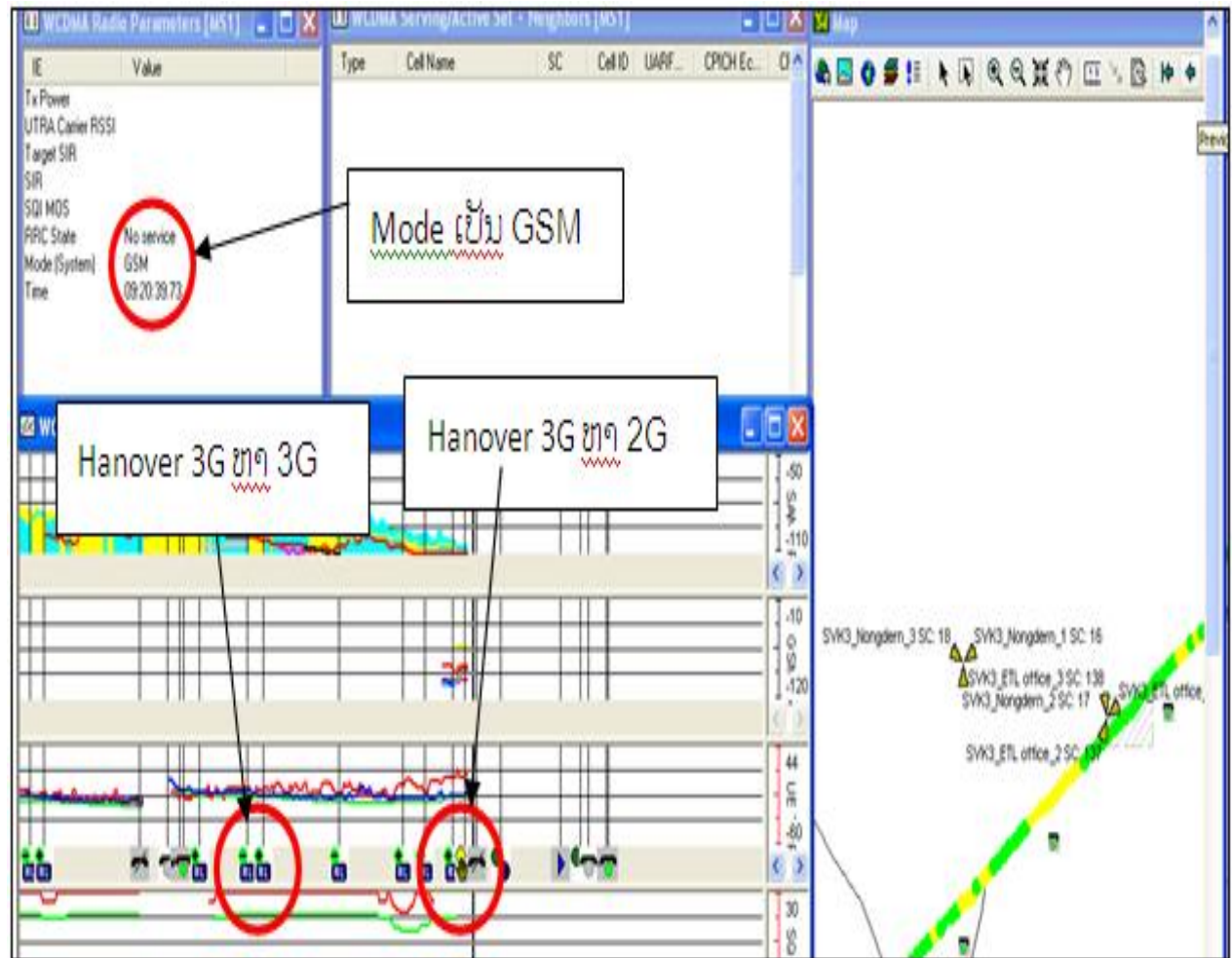
ຄ່າທີ່ໄດ້ອອກມາຂອງ HSDPA

ຄ່າທີ່ໄດ້ອອກມາຂອງ HSUPA

3. ການກວດກາ ການ Handover 2G/3G.

ໃນເນັດເວີກປະຈຸບັນເຮົາໄດ້ໃຊ້ 2G and 3G ໃນພື້ນທີ່ດຽວກັນສະນັ້ນການເຮັດ Handover ກັນລະຫວ່າງ 2G and 3G ແມ່ນມີຄວາມສໍາຄັນທີ່ສຸດເພາະ Coverage ຂອງ 2G ຈະມີ Coverage ຫລາຍກວ່າ 3G, ແຕ່ໃນຄວາມຕ້ອງການຕົວຈິງແມ່ນ ເວລາມືຖືຢູ່ໃນຖານະ Idle (ບໍ່ໄດ້ໂທ) ຈະໃຫ້ຈັບ 3G, ຖ້າເວລາໂທໃຫ້ໄປໃຊ້ 2G, ຖ້າມືຖືເລືອກເປັນ Auto Mode, ໃນເວລາເຮັດ DT Handover 2G and 3G ເຮົາຕ້ອງ ດັ່ງ Worksheet ເປັນຂອງ 2G and 3G ແລ້ວເວລາ Test ຖ້າມີການ Handover 3G ຫາ 2G ໃຫ້ສັງເກດໃນໜ້າຕ່າງ WCDMA Radio Parameter ໃນ Mode (system)ຈະເປັນ GSM, ຈາກນັ້ນໃຫ້ໄປເບິ່ງໃນ WCDMA Line Chat ຈະມີຮູບມືຂຶ້ນມາ ແລ້ວ

ໄປເບິ່ງ Worksheet ຂອງ 2G ຈະມີສັນຍານ 2G ຂຶ້ນມານັ້ນສະແດງວ່າການ Hand over 2G and 3G ສໍາເລັດ, ຖ້າ 3G Handover ຫາ 3G ຈະເປັນ RL ໃນ WCDMA Line Chat ດັ່ງຮູບລຸ່ມນີ້:



4.ການເຮັດ Driving Test Coverage 3G.

Coverage ຂອງລະບົບ 3G ຈະມີ Coverage ໄປບໍ່ໄດ້ໄກຄືກັບ 2G ເພາະລະບົບ 3G ທີ່ໃຊ້ແມ່ນໃຊ້ຄວາມສູງຄືໃຊ້ໃນຍານ 2100, ສະນັ້ນເວລາເຮັດ DT ຕ້ອງໃຫ້ສັງເກດ ແລະ ມີການຕີລາຄາໃນການໃຊ້ Coverage ໃຫ້ເໝາະສົມທີ່ສຸດ, ອາດຈະສັງເກດເບິ່ງພື້ນທີ່ຕົວຈິງ ແລະ Coverage ທີ່ມີຄວນຈະມີການປັບປ່ຽນແນວໃດໃຫ້ເໝາະສົມທີ່ສຸດໃນພື້ນທີ່ເພື່ອຫລີກເວັ້ນການຕໍາກັນຂອງ SC ຖ້າມີ SC ຕໍາກັນມັນຈະສົ່ງຜົນກະທົບຕໍ່ຄວາມນະພາບຂອງ Network ໄດ້. ເພາະລະບົບ 3G ມັນເປັນລະບົບວາຍແບນທີ່ໃຊ້ການ Multiplexing ເປັນ Code ບໍ່ແມ່ນຄວາມຖີ່ຄືກັບ 2G.

ບົດທີ 7

ການເຮັດລາຍງານຂອງການເຮັດ Optimisation



ໃນການເຮັດລາຍງານການເຮັດ Optimization ແມ່ນມີຄວາມສໍາຄັນເພື່ອຈະເປັນຈຸດທີ່ສະແດງໃຫ້ເຫັນເຖິງຈຸດທີ່ໄດ້ມີການປັບປຸງແລະ ວິທີການແກ້ໄຂ,ເພື່ອໃຫ້ມີຂໍ້ມູນໄວ້ເພື່ອໃຫ້ເປັນຂໍ້ມູນອ້າງອິງໃນຕໍ່ໜ້າເຊິ່ງໃນ ລະບົບ 2G/3G ໃນການເຮັດລາຍງານ ແມ່ນມີ ຄວາມແຕກຕ່າງກັນບາງອັນ ແລະ ກໍ່ມີບາງອັນກໍ່ຄ້າຍຄືກັນ.

ໃນບົດລາຍງານຈຸດສໍາຄັນແມ່ນຈຸດທີ່ສະແດງໃຫ້ເຫັນເຖິງບັນຫາ ແລະ ວິທີການແກ້ໄຂບັນຫາຕ່າງໆ ແລະ ຂໍ້ສະເໜີຕ່າງໆເພື່ອໃຫ້ທາງຂັ້ນເທິງ ຫຼື ພາກສ່ວນທີ່ກ່ຽວຂ້ອງເຖິງບັນຫາເພື່ອທີ່ມີການປັບປຸງໃຫ້ດີຂຶ້ນໃນຕໍ່ໜ້າ.

1. ການເຮັດລາຍງານ Optimization ລະບົບ 2G/3G.

ສໍາລັບການເຮັດລາຍງານໃນລະບົບ 2G ແມ່ນຈະເນັ້ນລາຍງານຈຸດທີ່ມີບັນຫາ ແລະ ວິທີການແກ້ໄຂ.

ໃນການເຮັດລາຍງານລະບົບ 3G ຈະມີຫົວຂໍ້ຫລັກດັ່ງນີ້:

- CS Service.

1. Voice call. (AMR).
2. Video Call (VP)

- PS Service.

1. HSDPA.
2. HSUPA.
3. R99.

- Handover:

1. ການເຮັດ HO 3G and 3G ພາຍໃນ Node B ດຽວກັນ.
2. ການເຮັດ HO 3G and 3G. ລະຫວ່າງ Node B.
3. ການເຮັດ HO 3G and 2G.

(ລາຍລະອຽດການເຮັດລາຍງານຈະເອົາລາຍງານຕົວຈິງໃຫ້ເບິ່ງເປັນແບບຢ່າງ)

2. ການເກັບຮັກສາອຸປະກອນເຄື່ອງ Driving Test.

ໃນການເກັບຮັກສາເຄື່ອງອຸປະກອນ DT ກໍ່ຄວນໃຫ້ຄວາມສໍາຄັນເພາະໂທລະສັບ Test ບໍ່ຄວນໃຫ້ມີການກະແທກ ຫລື ຕົກເພາະອາດຈະພາໃຫ້ໜ່ວຍມືຖືເສຍເຫຍ່ໄດ້, ເວລານໍາໄປໃຊ້ Test ອາດຈະບໍ່ໄດ້ມາດຕະຖານເທົ່າທີ່ຄວນ, ອາຍຸການໃຊ້ງານອາດຈະໃຊ້ບໍ່ໄດ້ດົນ, ເຊິ່ງຄວນປະຕິບັດກັບກັບເຄື່ອງ DT ດັ່ງນີ້:

- ເຄື່ອງ DT ຄວນໃສ່ກັບ (BOX) ທີ່ມີໂຟມຮອງເພື່ອກັນກະທົບ.
- ເຄື່ອງ DT ບໍ່ຄວນເອົາໄປໃຊ້ໃນວຽກສ່ວນຕົວ.
- ເຄື່ອງ DT ເວລາສໍາເລັດການເຮັດ DT ແລ້ວຄວນຈະມອດແລ້ວຈິງເອົາໄປເກັບມຽນ.
- ບໍ່ຄວນໃຊ້ຈົນໃຫ້ Battery ໝົດ.
- Dongkey ຫາມເຮັດຫັກ ຫລື ແຕກເດັດຂາດ.



Thank you for your attention!
Questions please?

