

**Department of Electricity, Ministry of
Energy and Mines
Electricité du Laos
Lao People's Democratic Republic**

**The Study on
Power Network System Plan
in
Lao People's Democratic Republic**

**Final Report
(Appendices)**

January 2010

JAPAN INTERNATIONAL COOPERATION AGENCY

Tokyo Electric Power Company, Inc.

Nippon Koei Co., Ltd.

IDD
JR
09-094

Appendix 7.5

NBCA and Protection Forest

(Source: Department of Forestry, Ministry of Agriculture and Forestry)

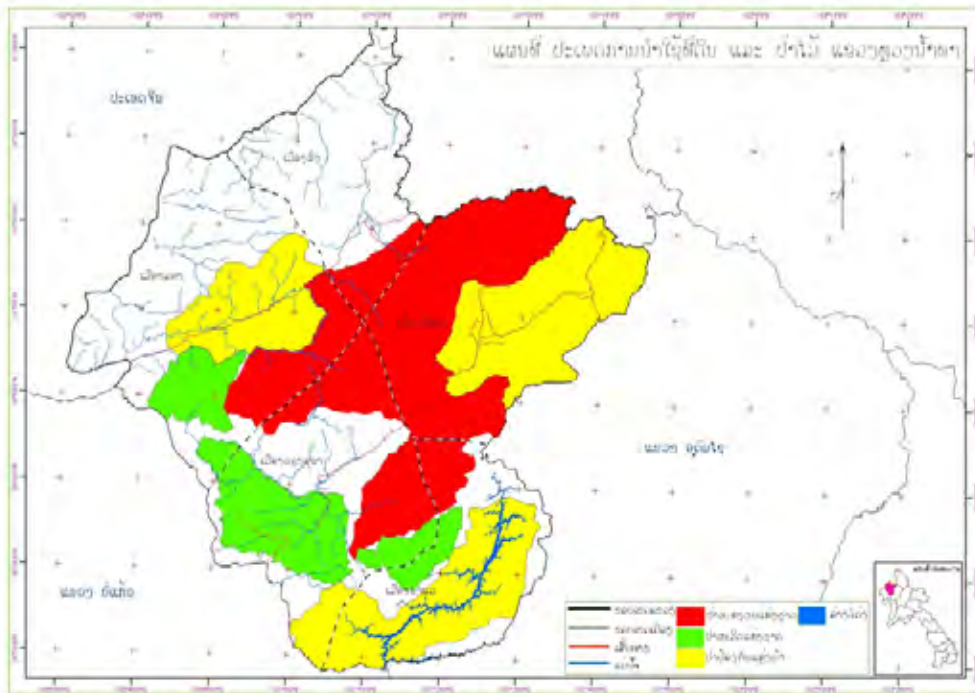
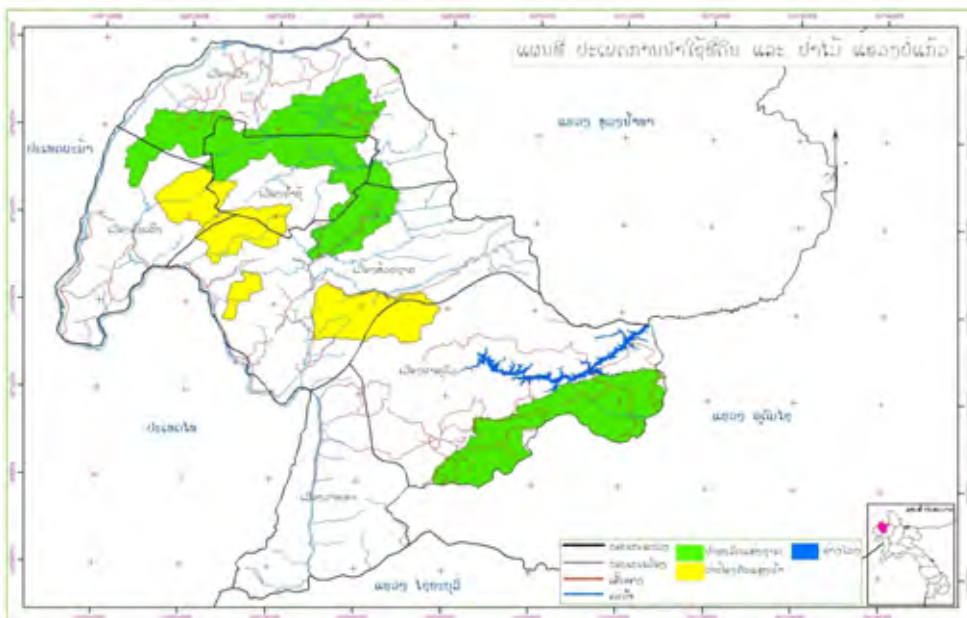


Figure 1 NBCA and Protection Forest in Luang Namtha Province



■ NBCA
 ■ Protection Forest

Figure 2 NBCA and Protection Forest in Bokeo Province

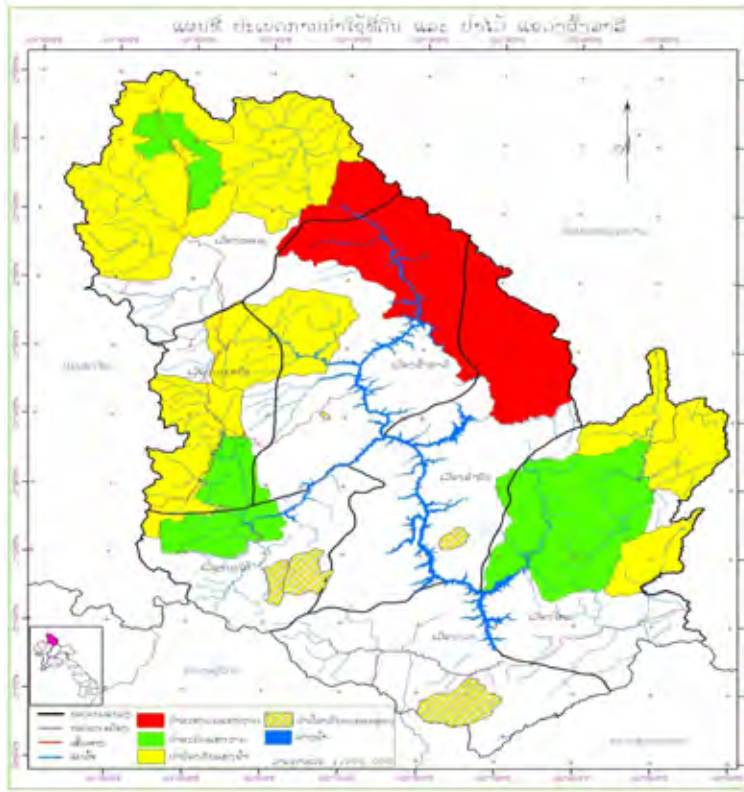


Figure 3 NBCA and Protection Forest in Pongsaly Province

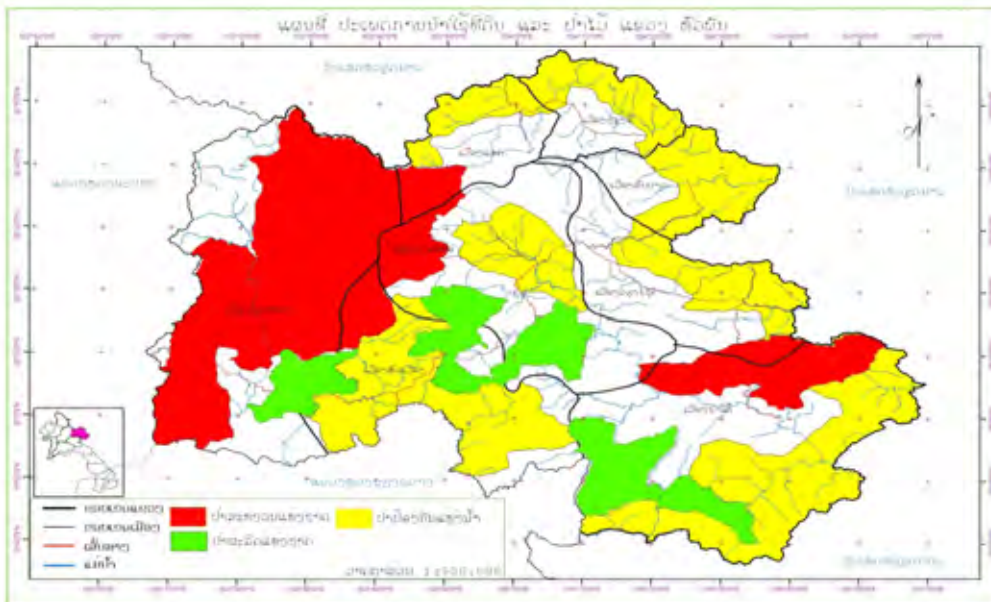


Figure 4 NBCA and Protection Forest in Houaphanh Province

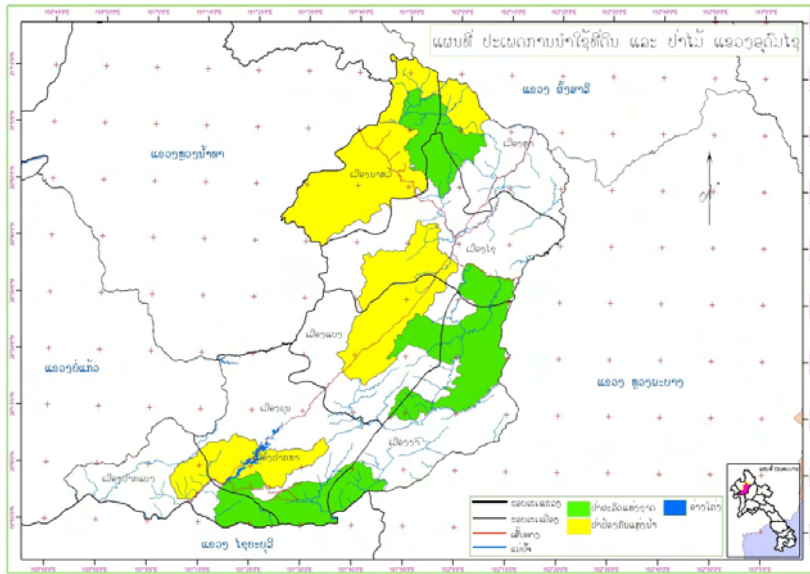


Figure 5 NBCA and Protection Forest in Oudomxay Province

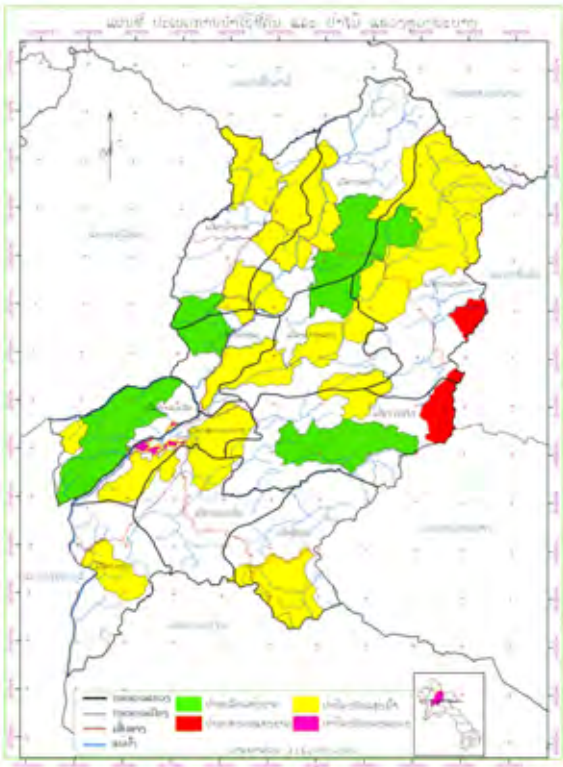
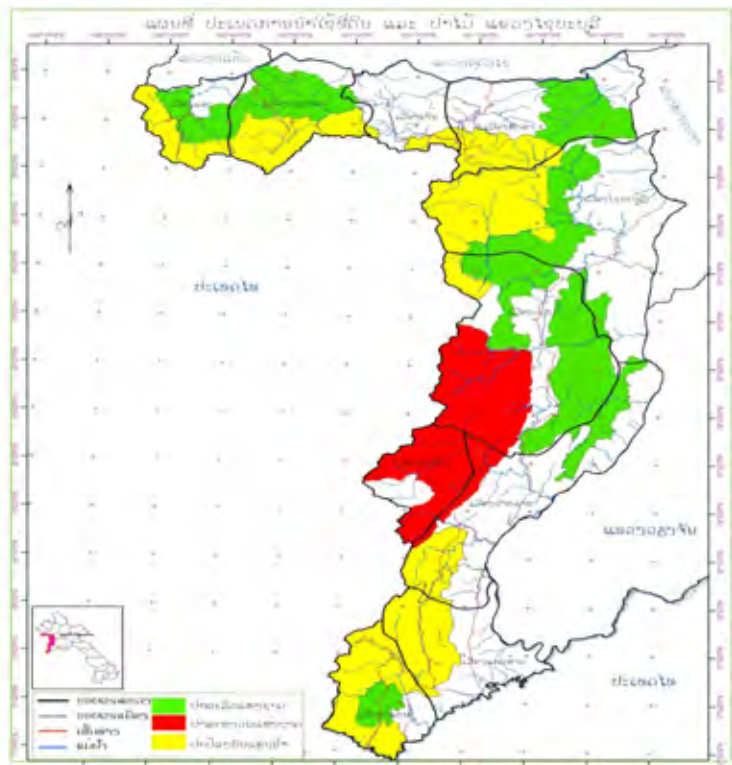


Figure 6 NBCA and Protection Forest in Luang Prabang Province



■ NBCA ■ Protection Forest

Figure 7 NBCA and Protection Forest in Xayaboury Province

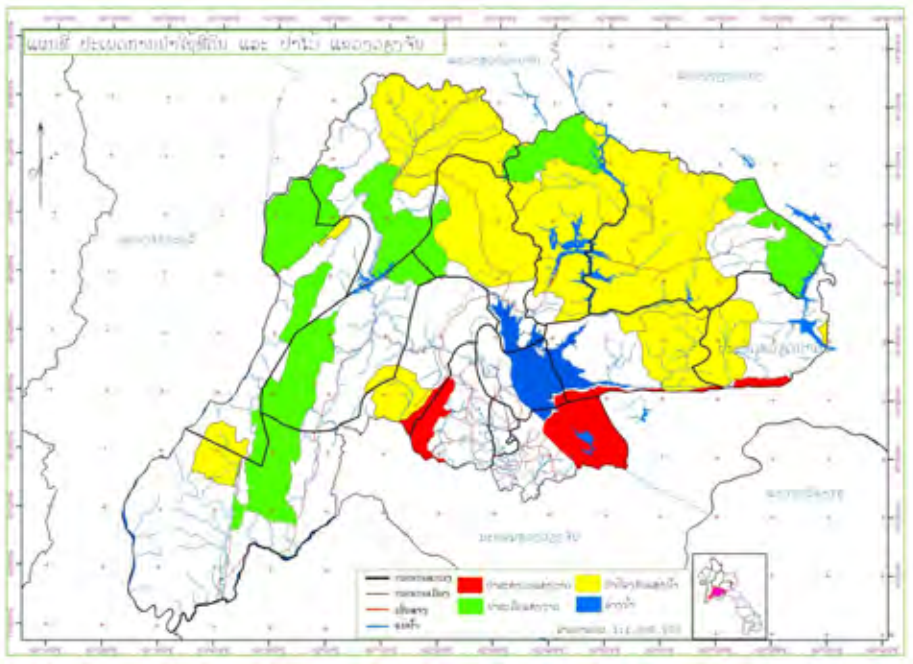
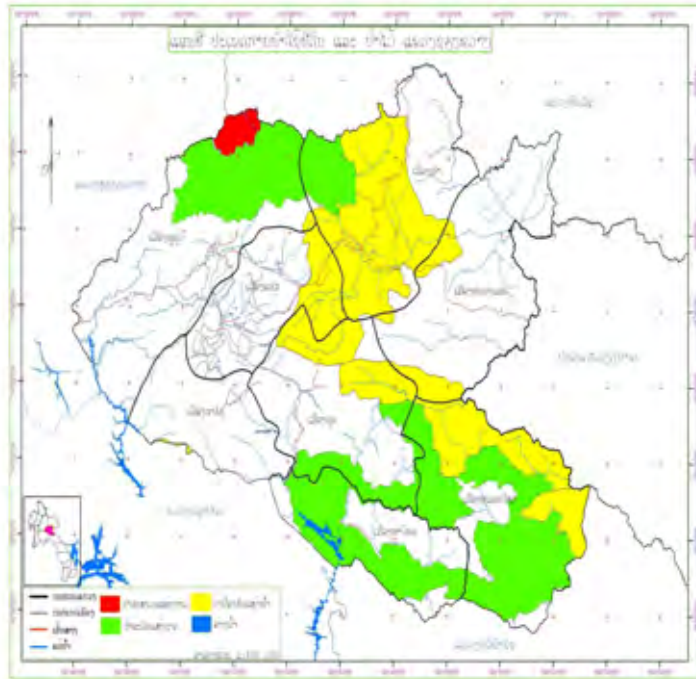
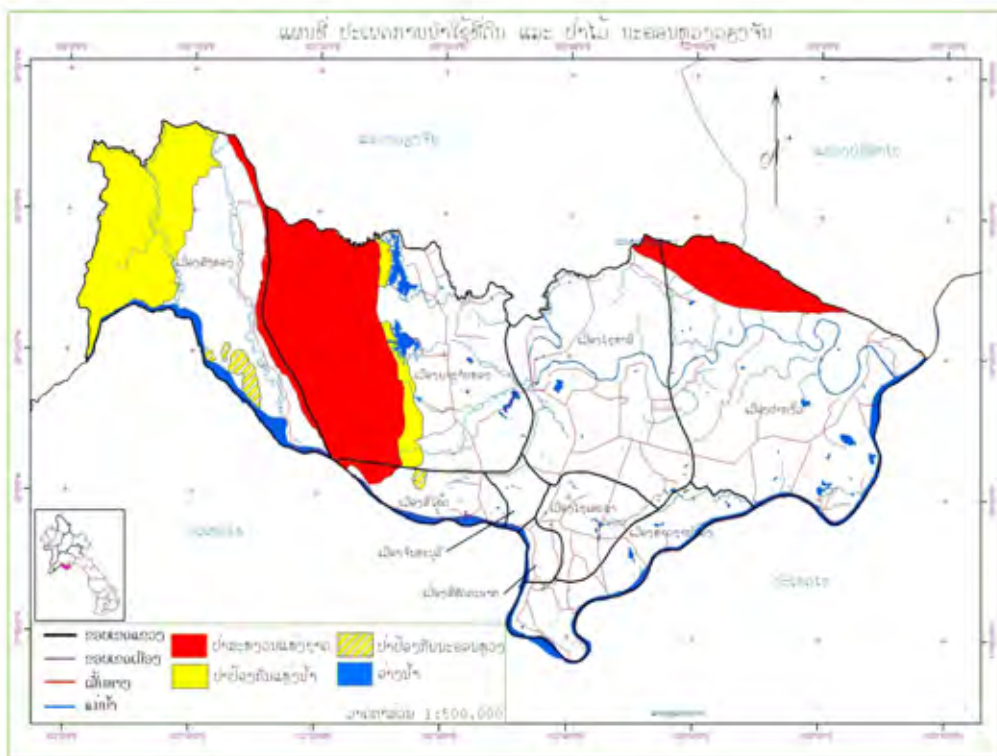


Figure 8 NBCA and Protection Forest in Xieng Khuang Province



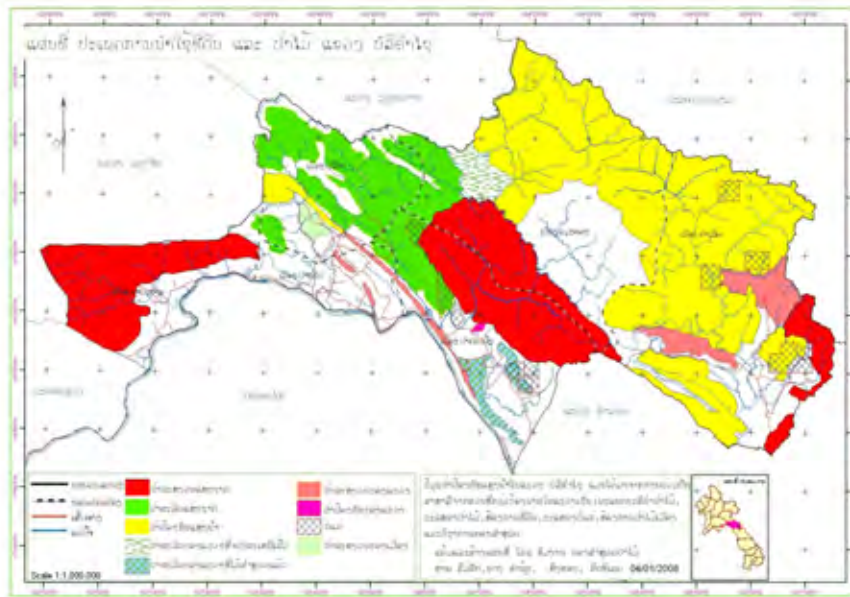
■ NBCA ■ Protection Forest

Figure 9 NBCA and Protection Forest in Vientiane Province



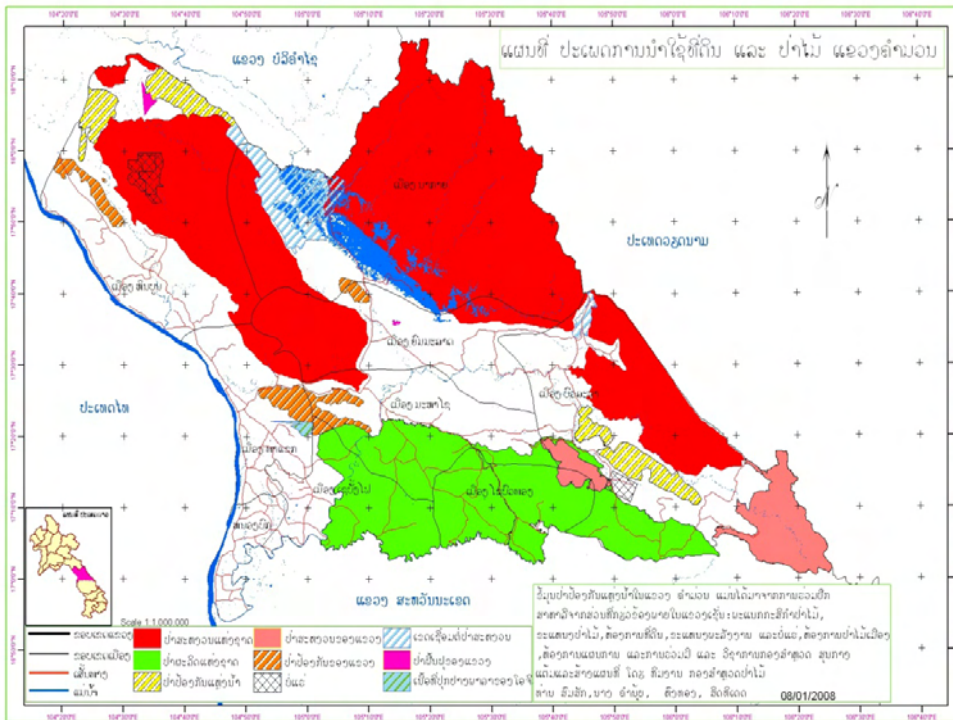
■ NBCA ■ Protection Forest

Figure 10 NBCA and Protection Forest in Vientiane City



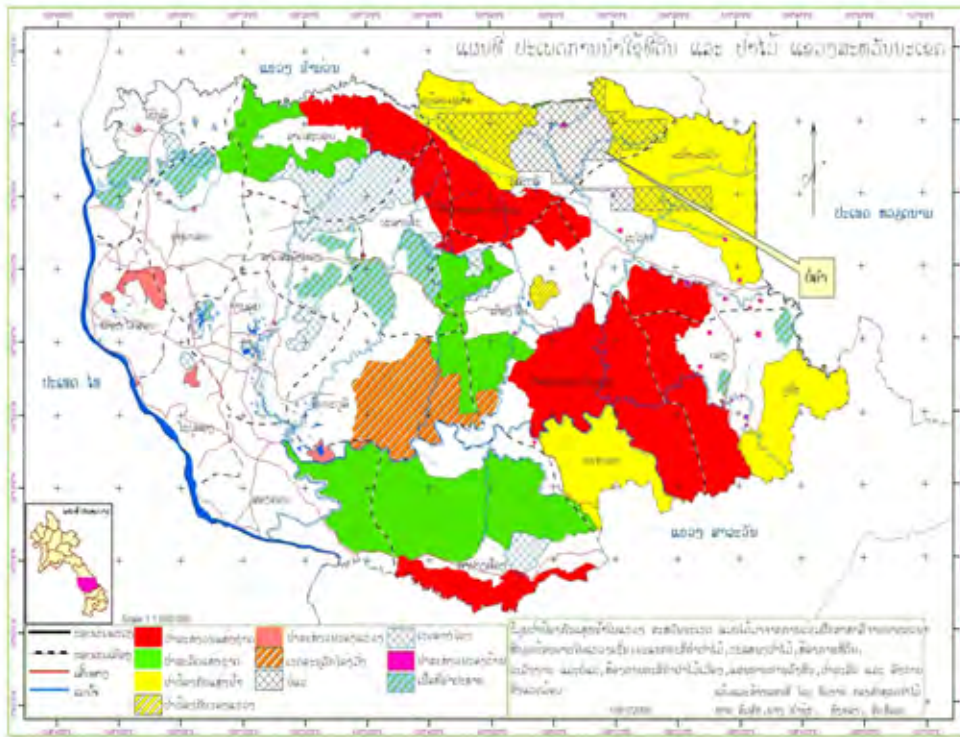
■ NBCA ■ Protection Forest

Figure 11 NBCA and Protection Forest in Bolikhamxay Province



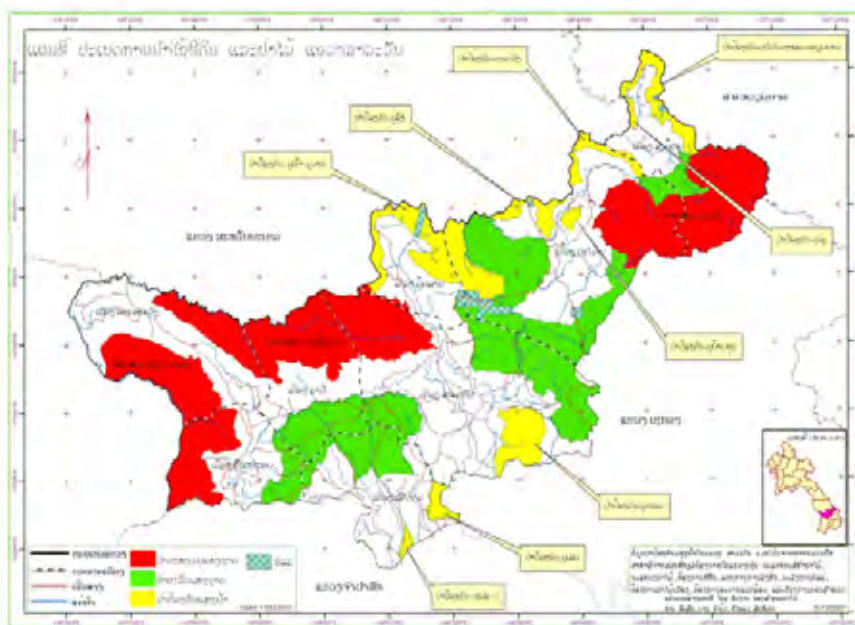
■ NBCA ■ Protection Forest

Figure 12 NBCA and Protection Forest in Khammouan Province



■ NBCA ■ Protection Forest

Figure 13 NBCA and Protection Forest in Savannakhet Province



■ NBCA ■ Protection Forest

Figure 14 NBCA and Protection Forest in Saravan Province

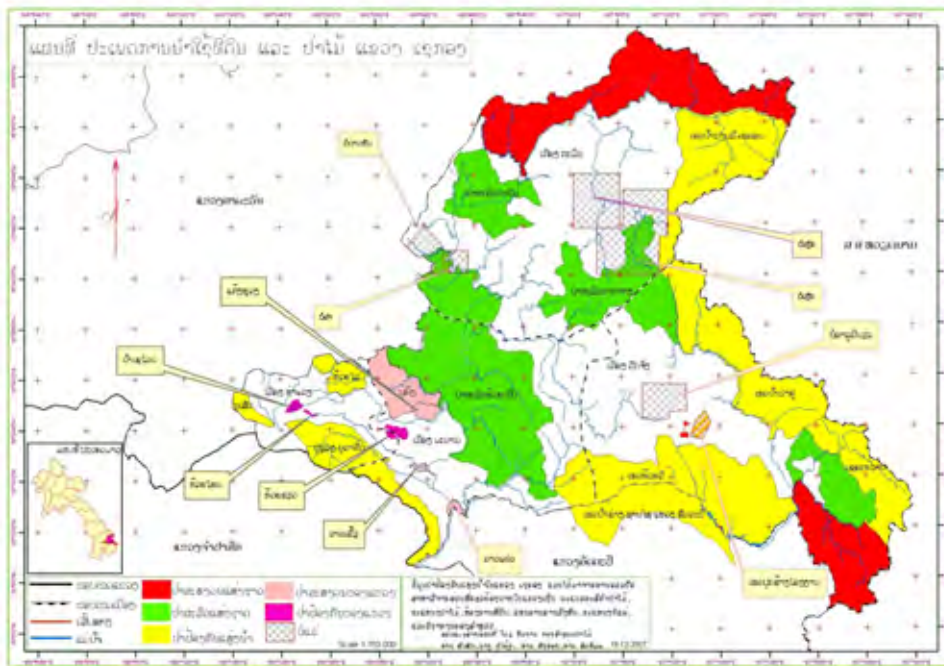


Figure 15 NBCA and Protection Forest in Sekong Province

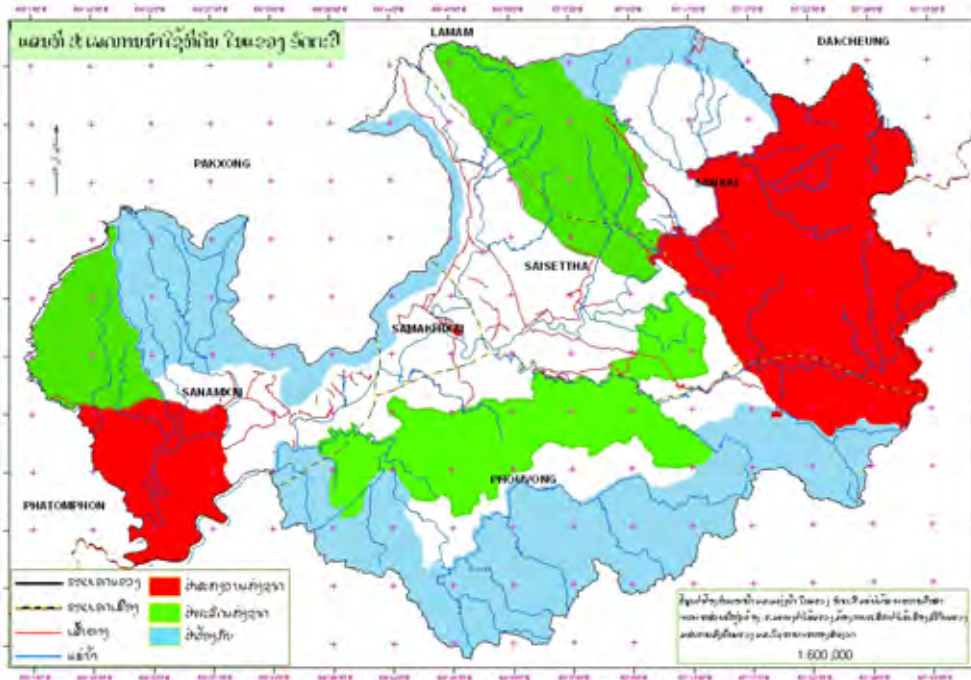
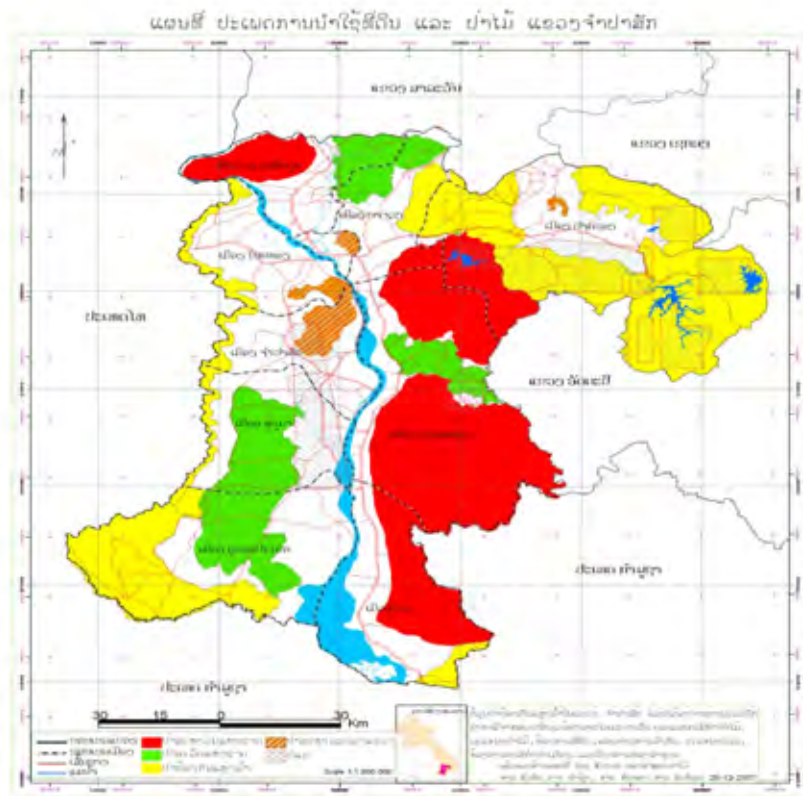


Figure 16 NBCA and Protection Forest in Attapeu Province

■ NBCA ■ Protection Forest

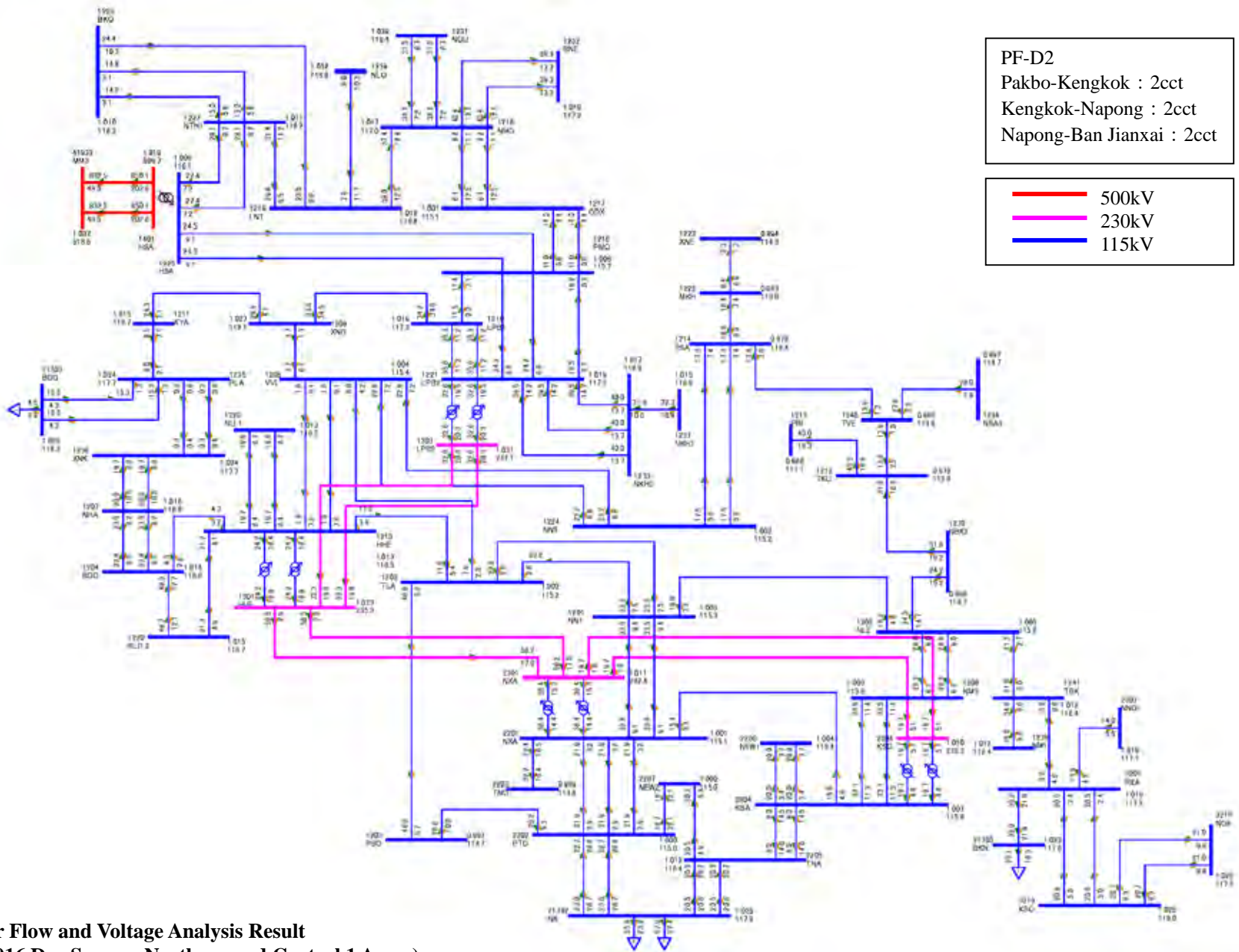


■ NBCA ■ Protection Forest

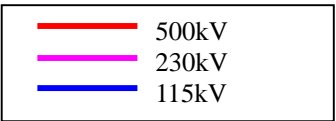
Figure 17 NBCA and Protection Forest in Champasack Province

Appendix 8.8-1

Power Flow and Voltage Analysis Results (Yr 2016)

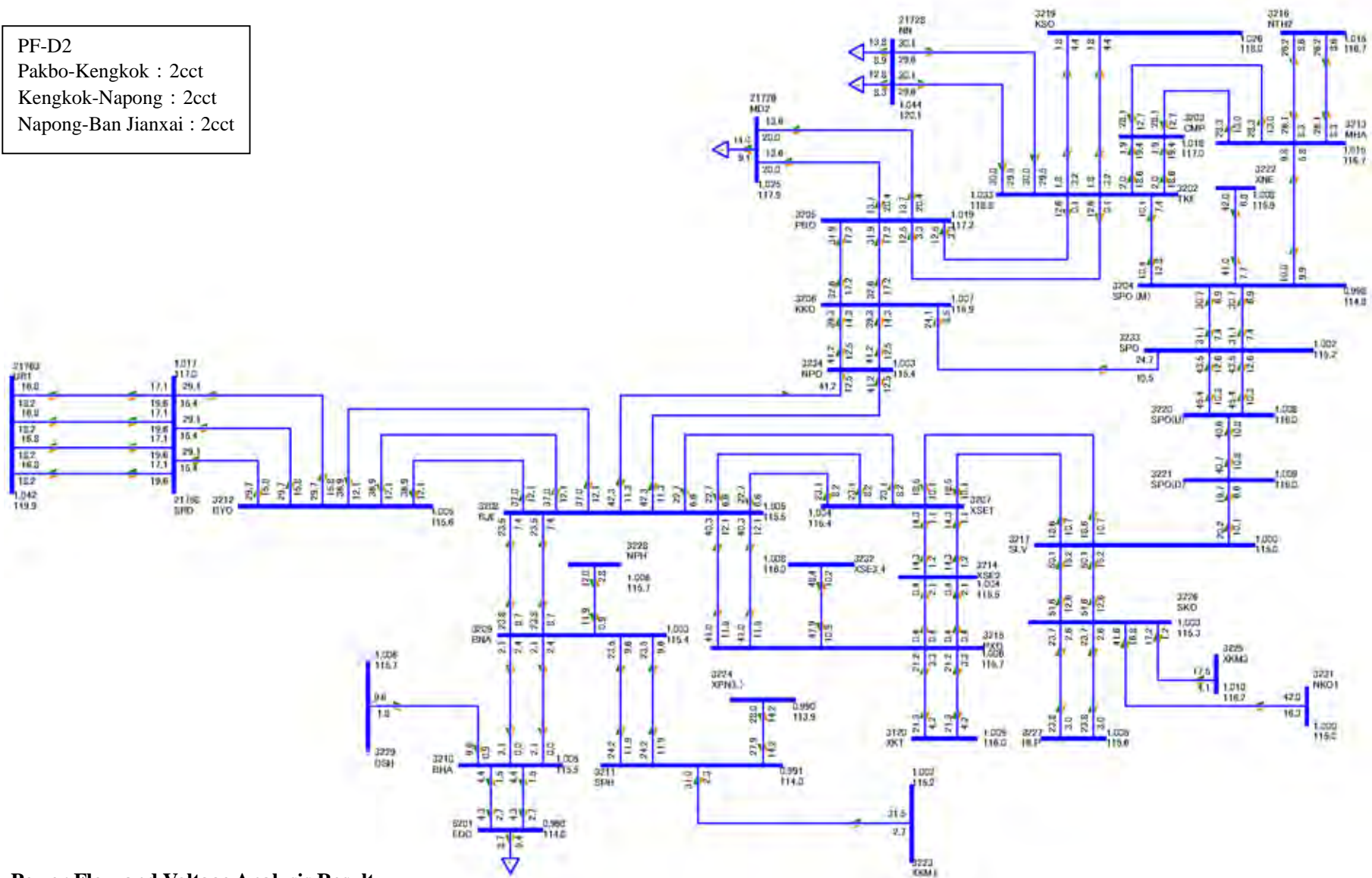


PF-D2
 Pakbo-Kengkok : 2cct
 Kengkok-Napong : 2cct
 Napong-Ban Jianxai : 2cct

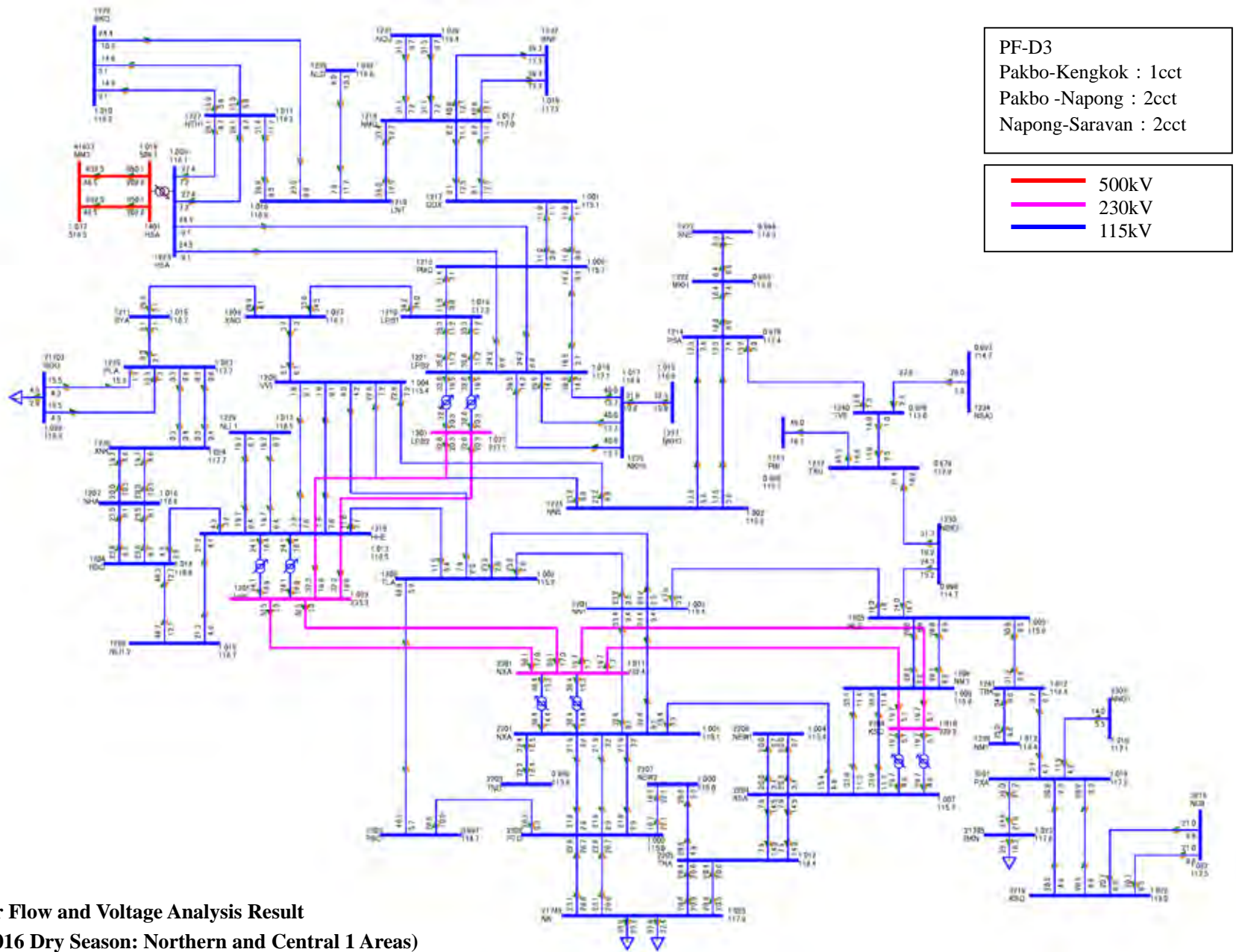


Power Flow and Voltage Analysis Result
 (Yr 2016 Dry Season: Northern and Central 1 Areas)

PF-D2
 Pakbo-Kengkok : 2cct
 Kengkok-Napong : 2cct
 Napong-Ban Jianxai : 2cct

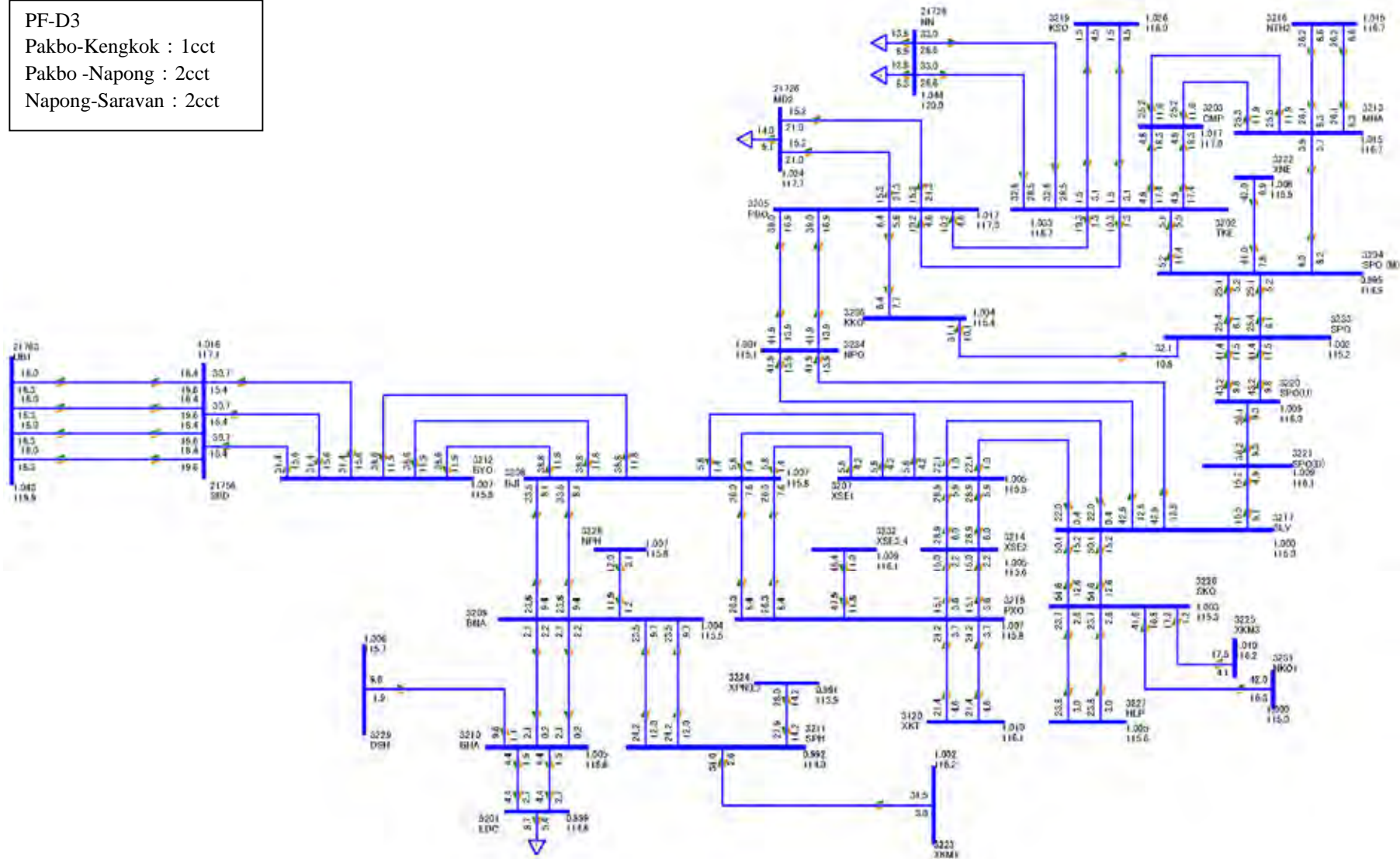


**Power Flow and Voltage Analysis Result
 (Yr 2016 Dry Season: Central 2 and Southern Areas)**

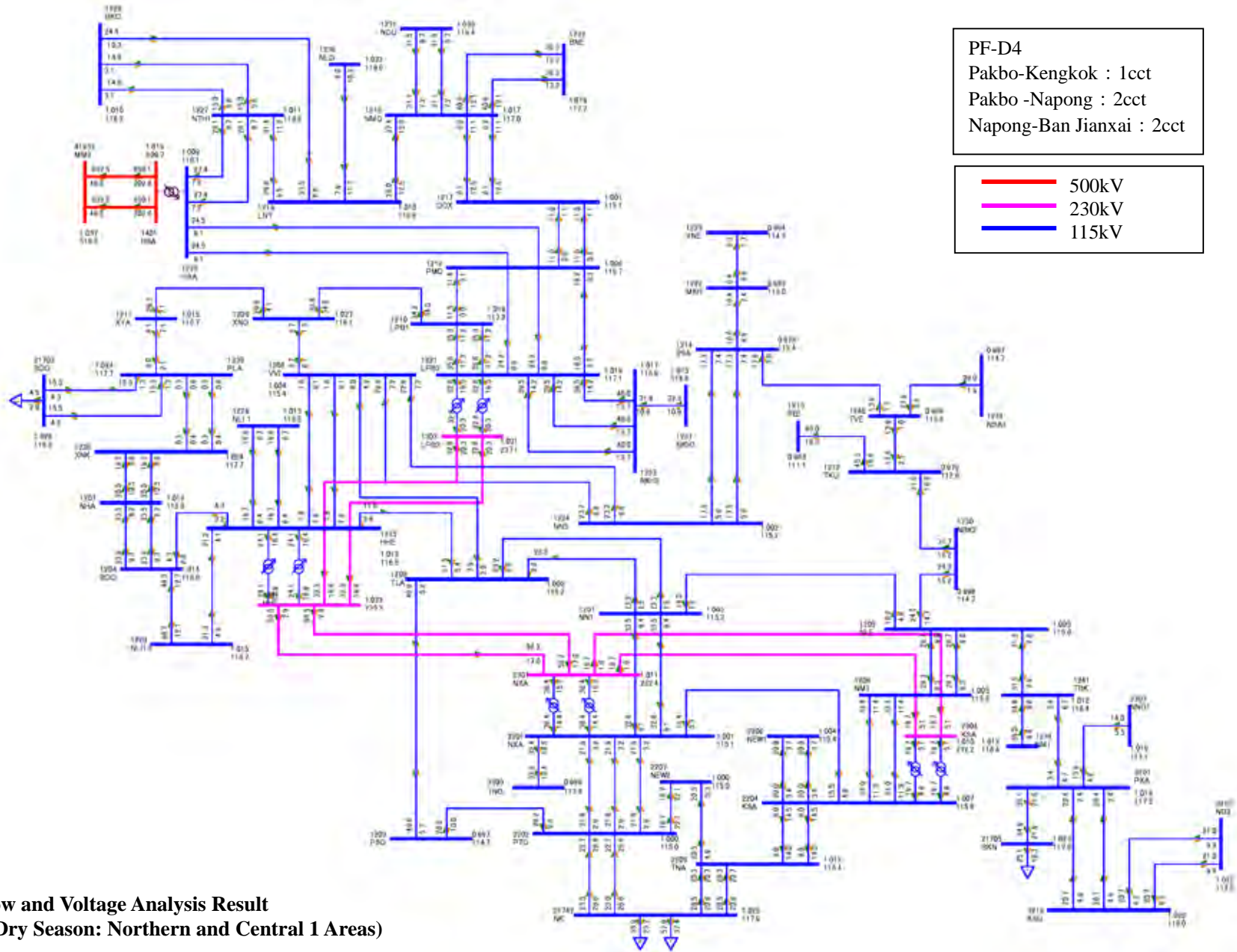


Power Flow and Voltage Analysis Result
 (Yr 2016 Dry Season: Northern and Central 1 Areas)

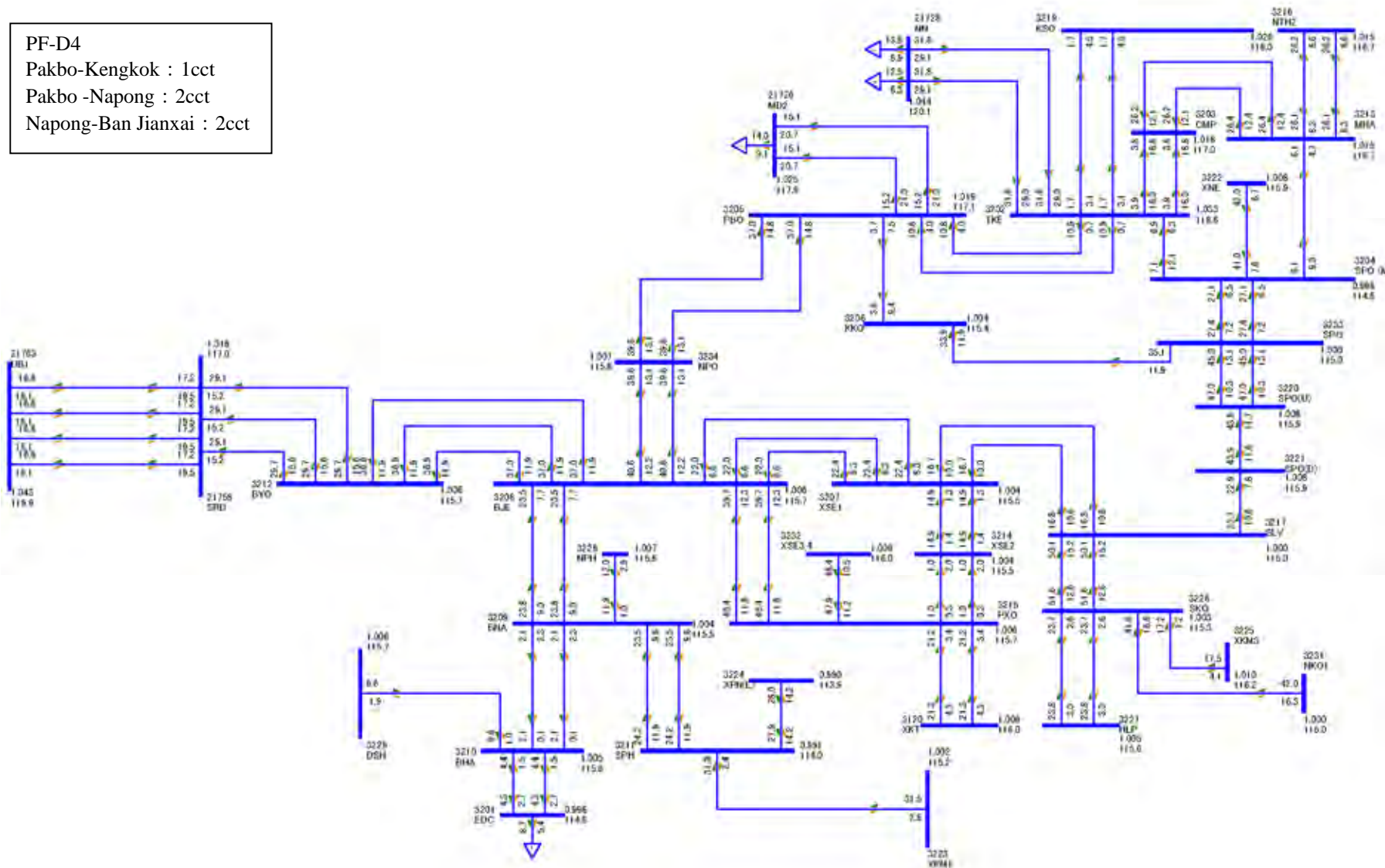
PF-D3
 Pakbo-Kengkok : 1cct
 Pakbo -Napong : 2cct
 Napong-Saravan : 2cct



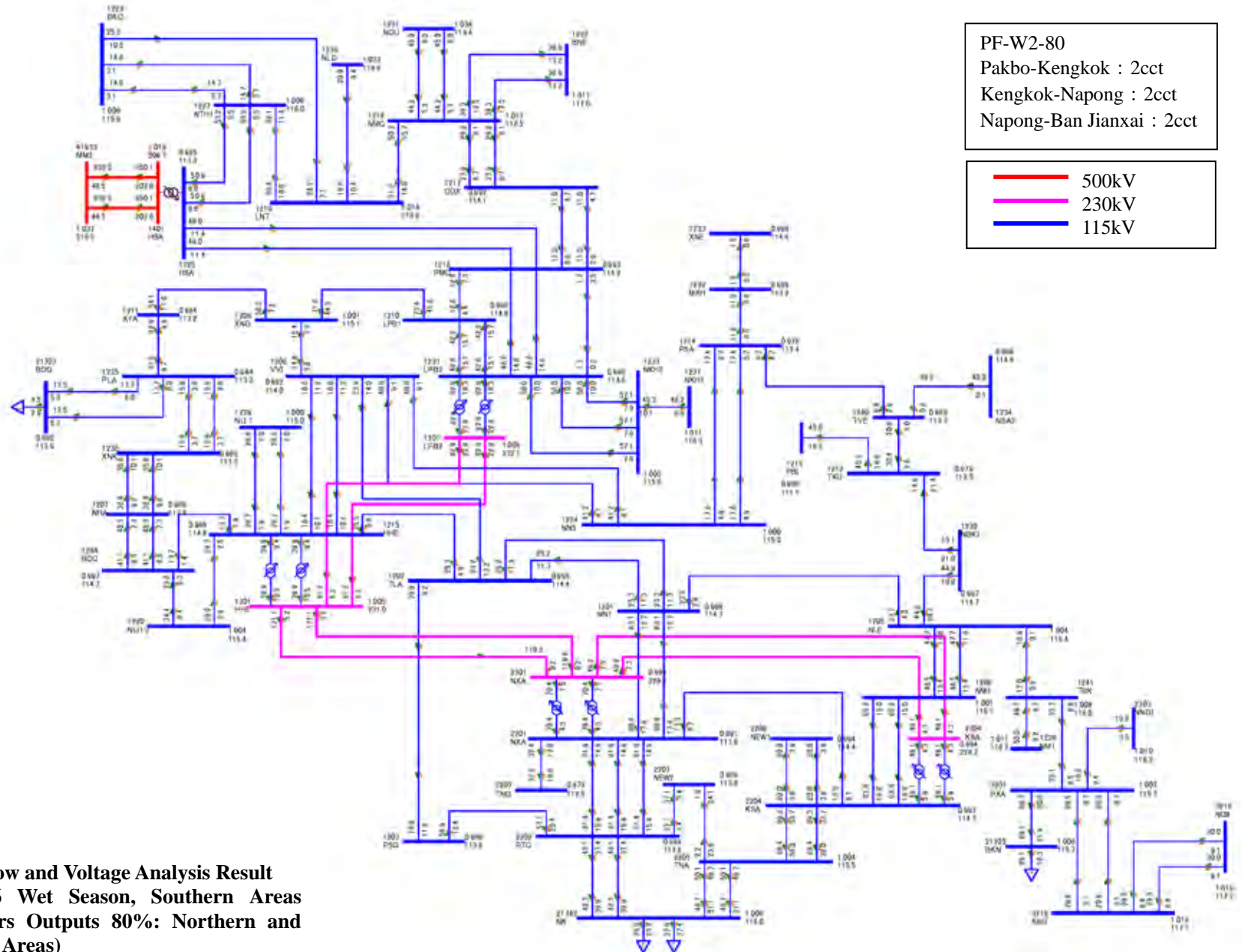
Power Flow and Voltage Analysis Result
 (Yr 2016 Dry Season: Central 2 and Southern Areas)



PF-D4
 Pakbo-Kengkok : 1cct
 Pakbo -Napong : 2cct
 Napong-Ban Jianxai : 2cct



Power Flow and Voltage Analysis Result
 (Yr 2016 Dry Season: Central 2 and Southern Areas)

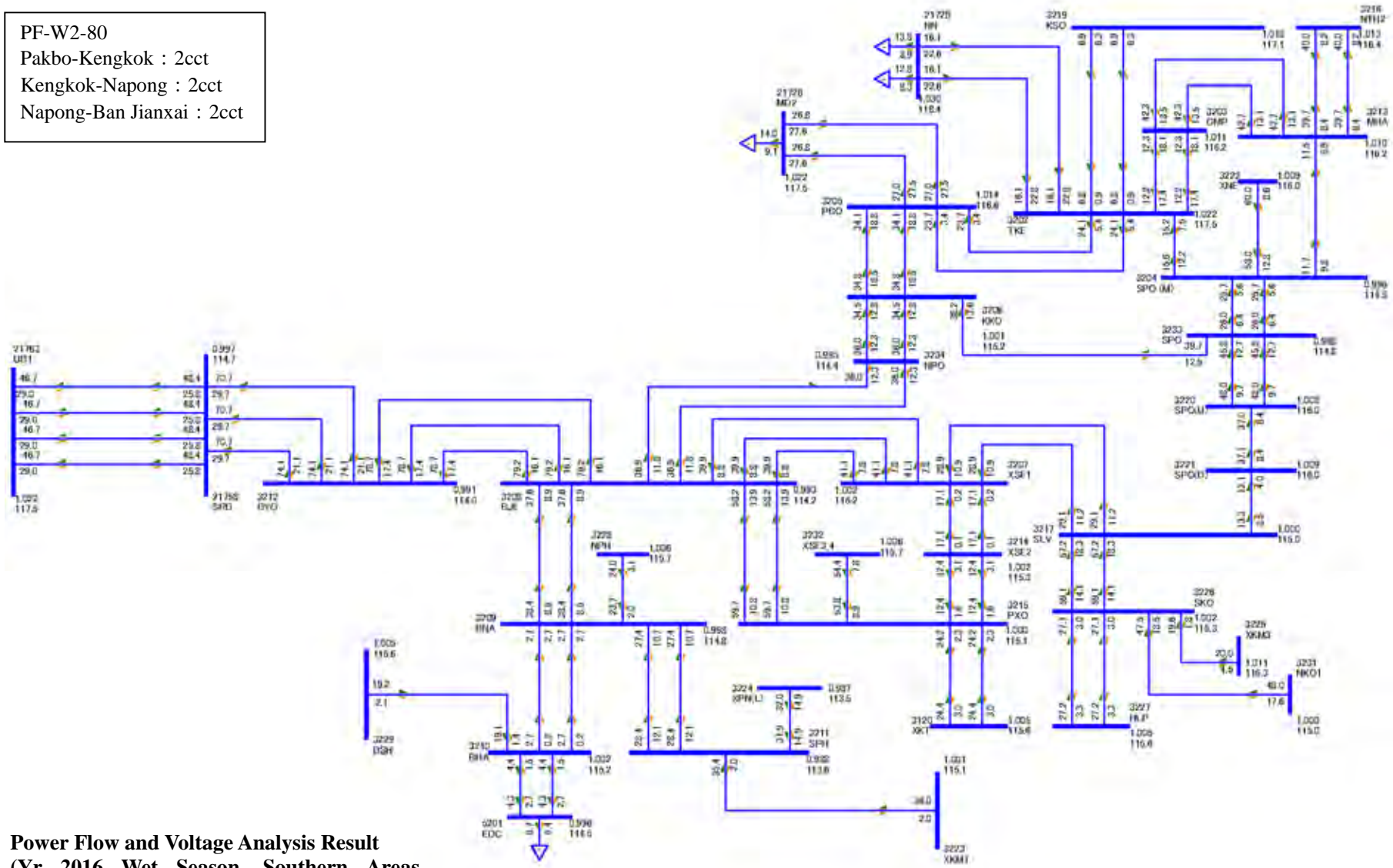


PF-W2-80
 Pakbo-Kengkok : 2cct
 Kengkok-Napong : 2cct
 Napong-Ban Jianxai : 2cct

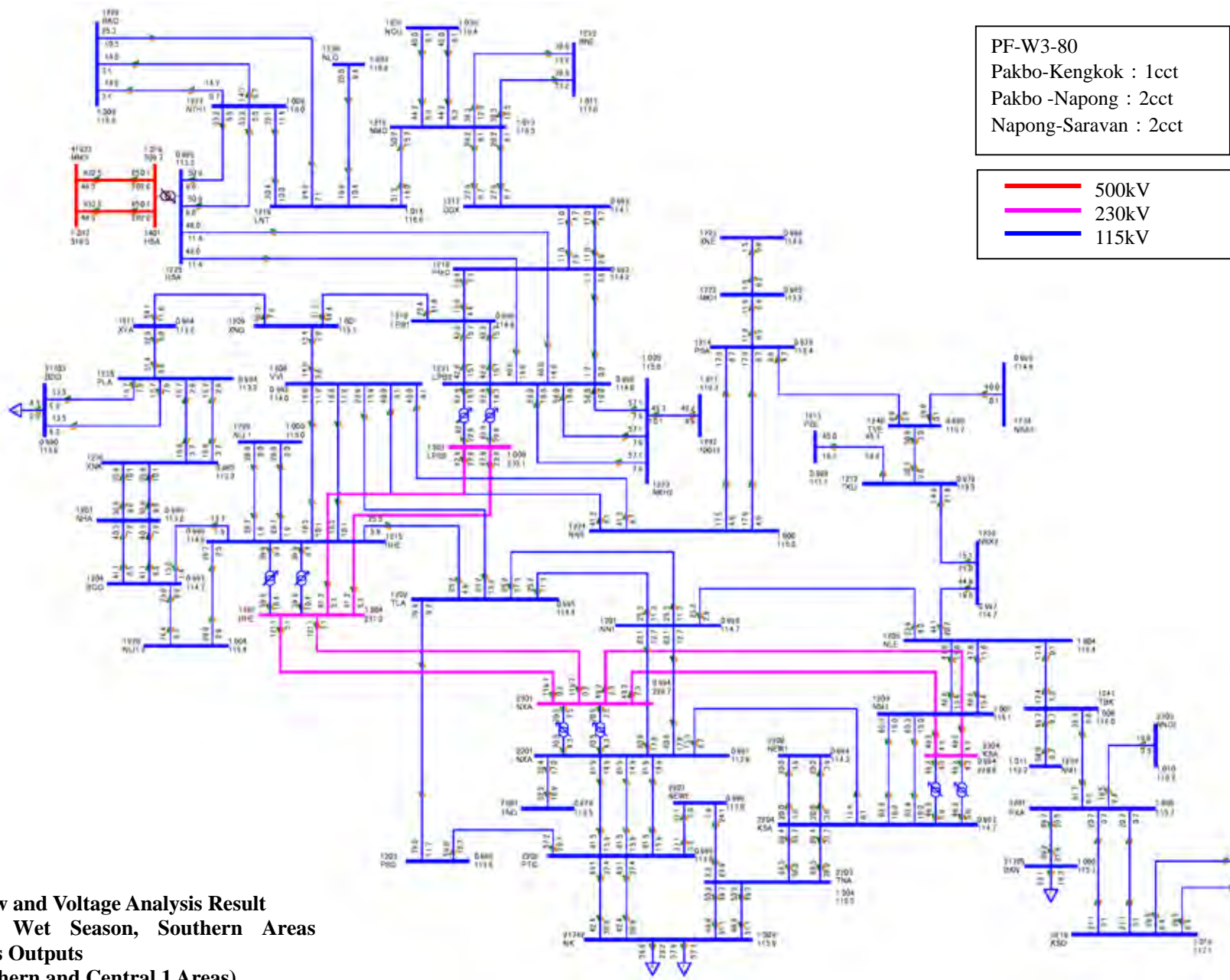
500kV
 230kV
 115kV

**Power Flow and Voltage Analysis Result
 (Yr 2016 Wet Season, Southern Areas
 Generators Outputs 80%: Northern and
 Central 1 Areas)**

PF-W2-80
 Pakbo-Kengkok : 2cct
 Kengkok-Napong : 2cct
 Napong-Ban Jianxai : 2cct

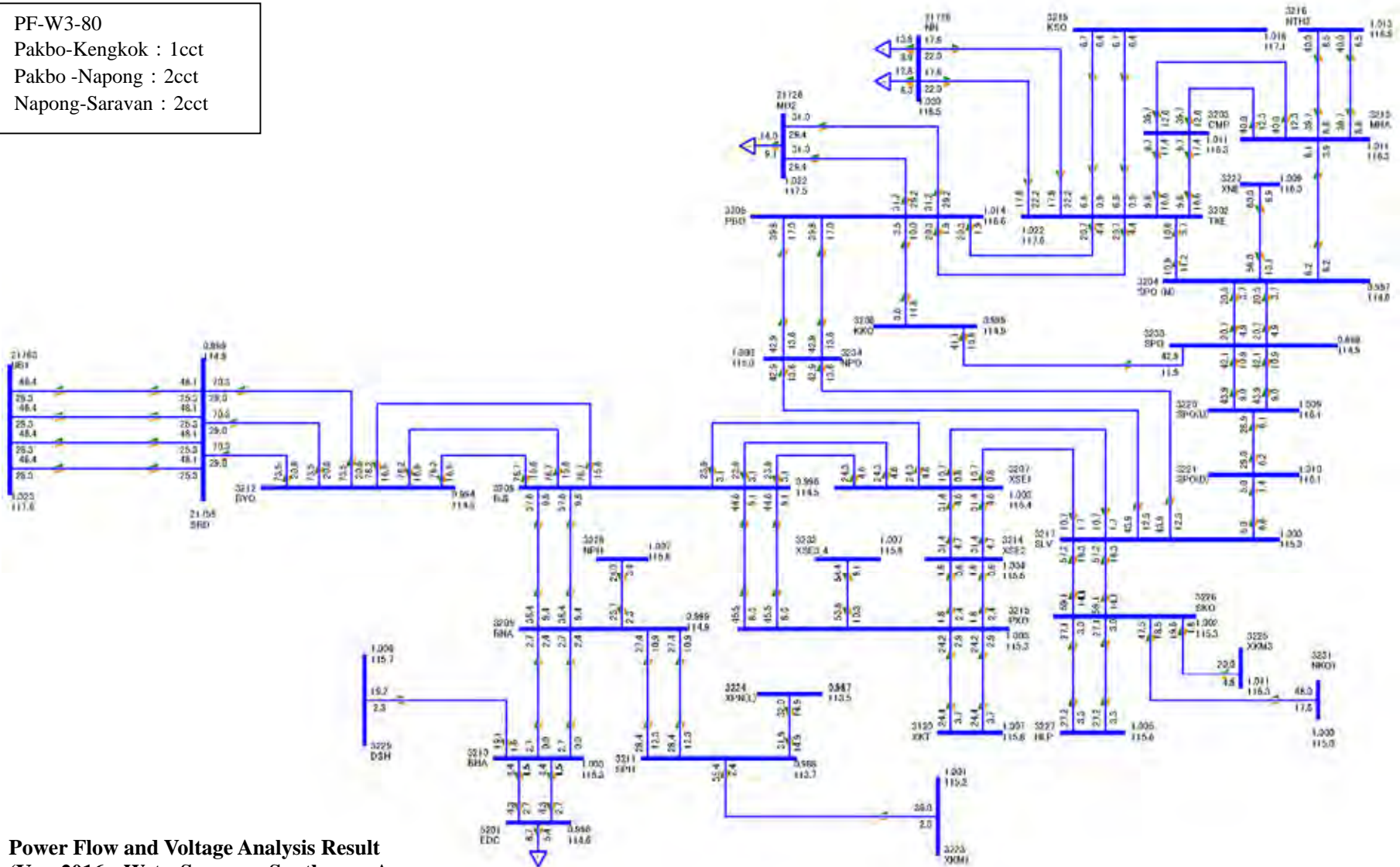


**Power Flow and Voltage Analysis Result
 (Yr 2016 Wet Season, Southern Areas
 Generators Outputs
 80%: Central 2 and Southern Areas)**

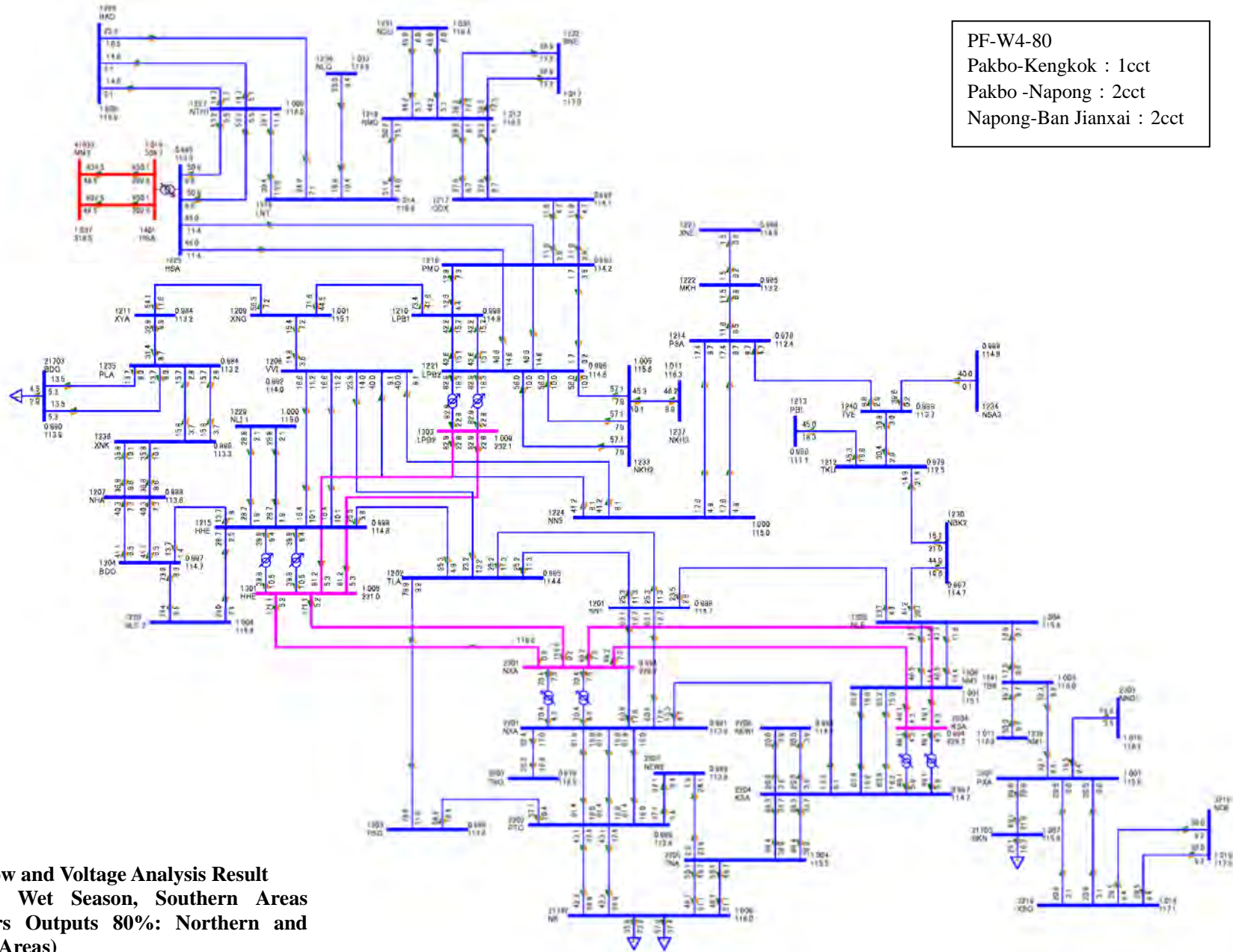


**Power Flow and Voltage Analysis Result
 (Yr 2016 Wet Season, Southern Areas
 Generators Outputs
 80%: Northern and Central 1 Areas)**

PF-W3-80
 Pakbo-Kengkok : 1cct
 Pakbo -Napong : 2cct
 Napong-Saravan : 2cct



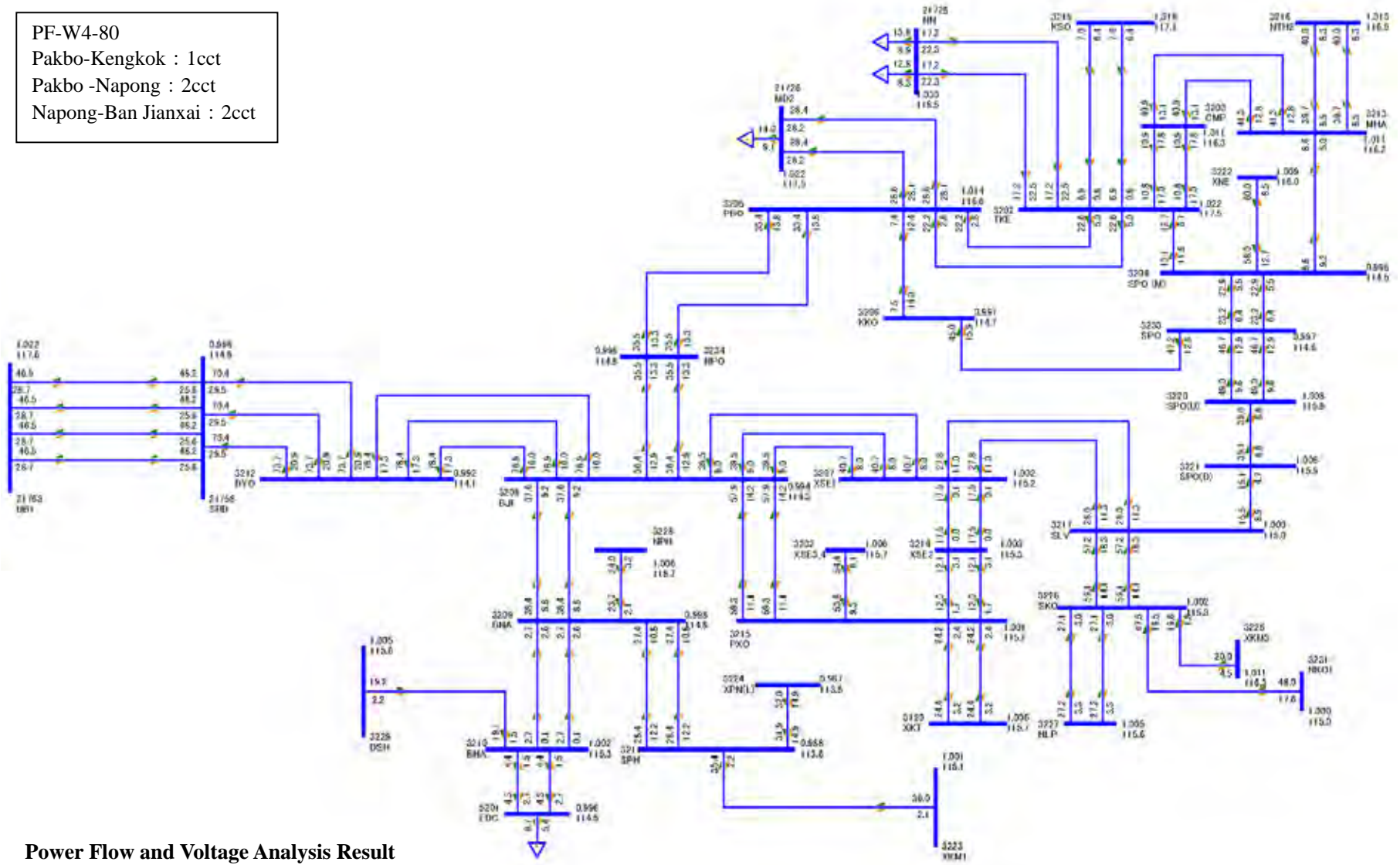
Power Flow and Voltage Analysis Result
 (Yr 2016 Wet Season, Southern Areas
 Generators Outputs 80%: Central 2 and
 Southern Areas)



PF-W4-80
 Pakbo-Kengkok : 1cct
 Pakbo-Napong : 2cct
 Napong-Ban Jianxai : 2cct

Power Flow and Voltage Analysis Result
 (Yr 2016 Wet Season, Southern Areas
 Generators Outputs 80%: Northern and
 Central 1 Areas)

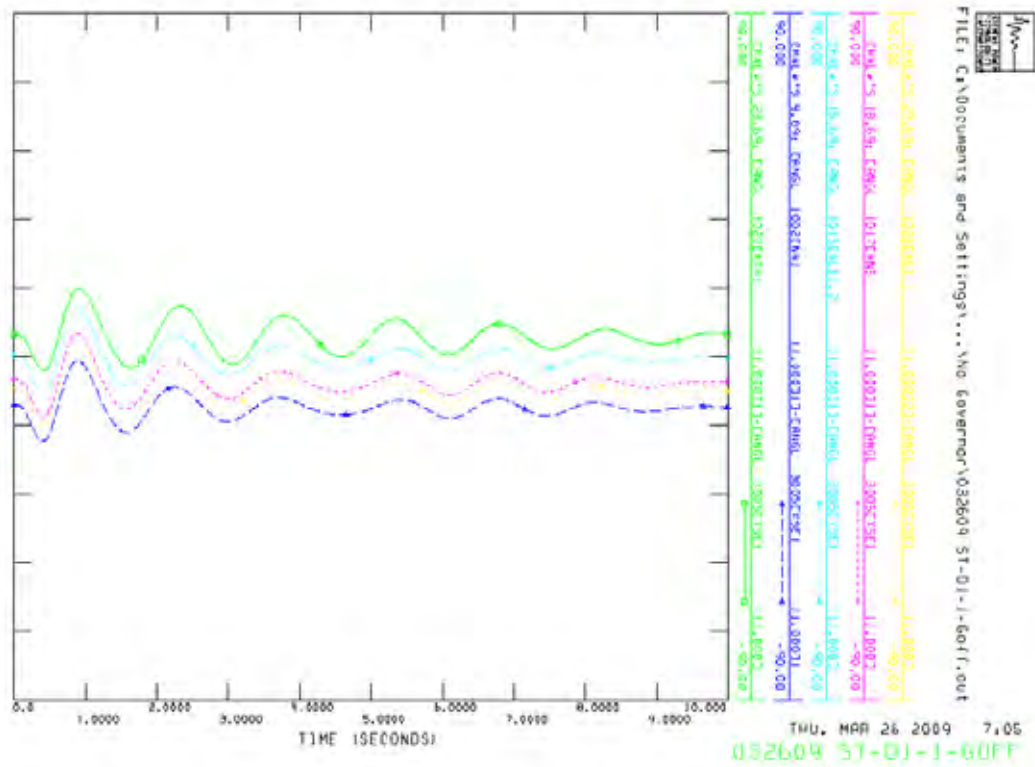
PF-W4-80
 Pakbo-Kengkok : 1cct
 Pakbo -Napong : 2cct
 Napong-Ban Jianxai : 2cct



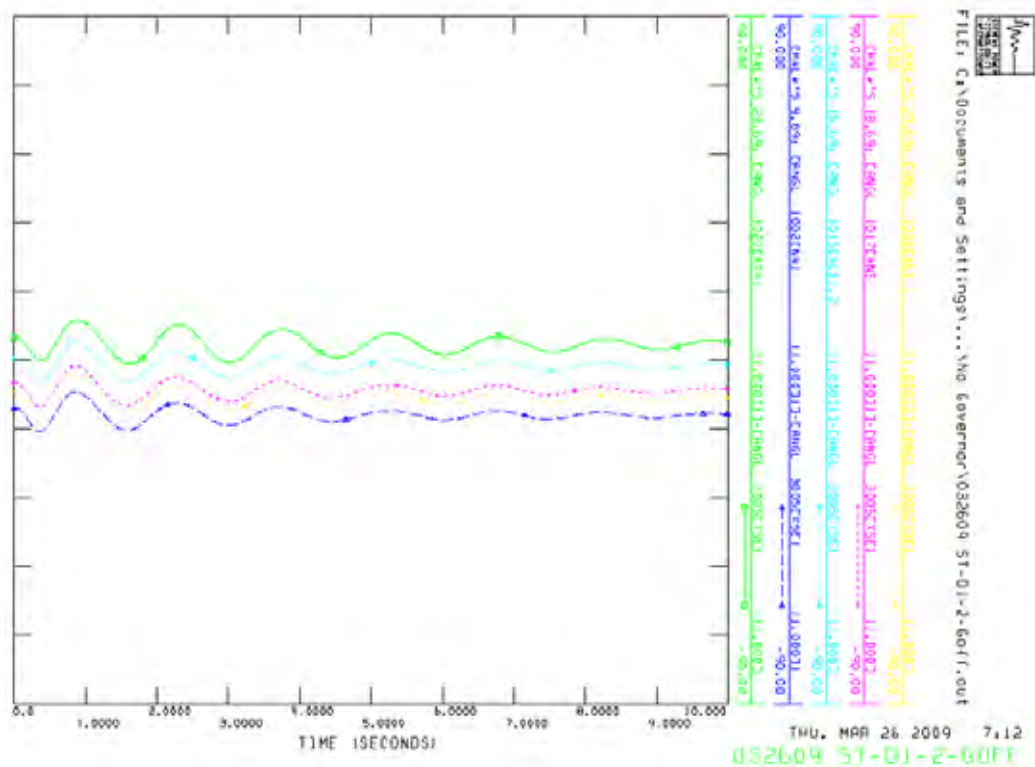
**Power Flow and Voltage Analysis Result
 (Yr 2016 Wet Season, Southern Areas
 Generators Outputs 80%: Central 2 and
 Southern Areas)**

Appendix 8.8-2

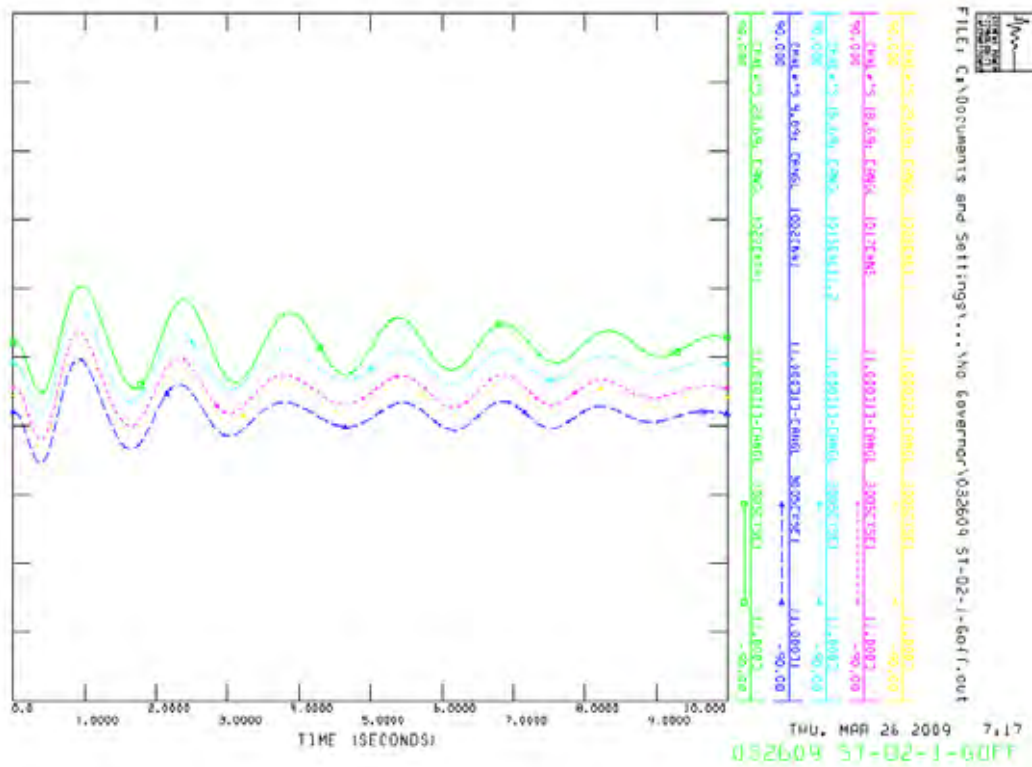
Stability Analysis Results (Phase Angle Oscillation Waveforms) (Yr 2016)



ST-D1-1 Year 2016 (Dry Season)
Bus Fault: Saravan, Trip: Saravan - Napong

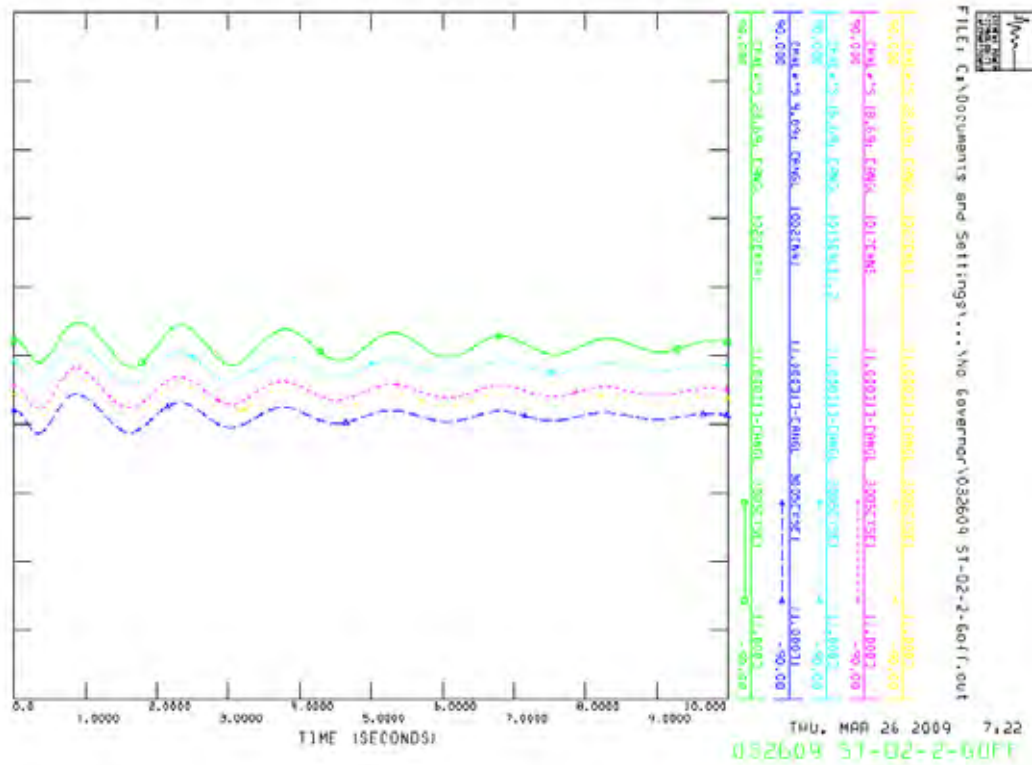


ST-D1-2 Year 2016 (Dry Season)
Bus Fault: Napong, Trip: Napong - Kengkok



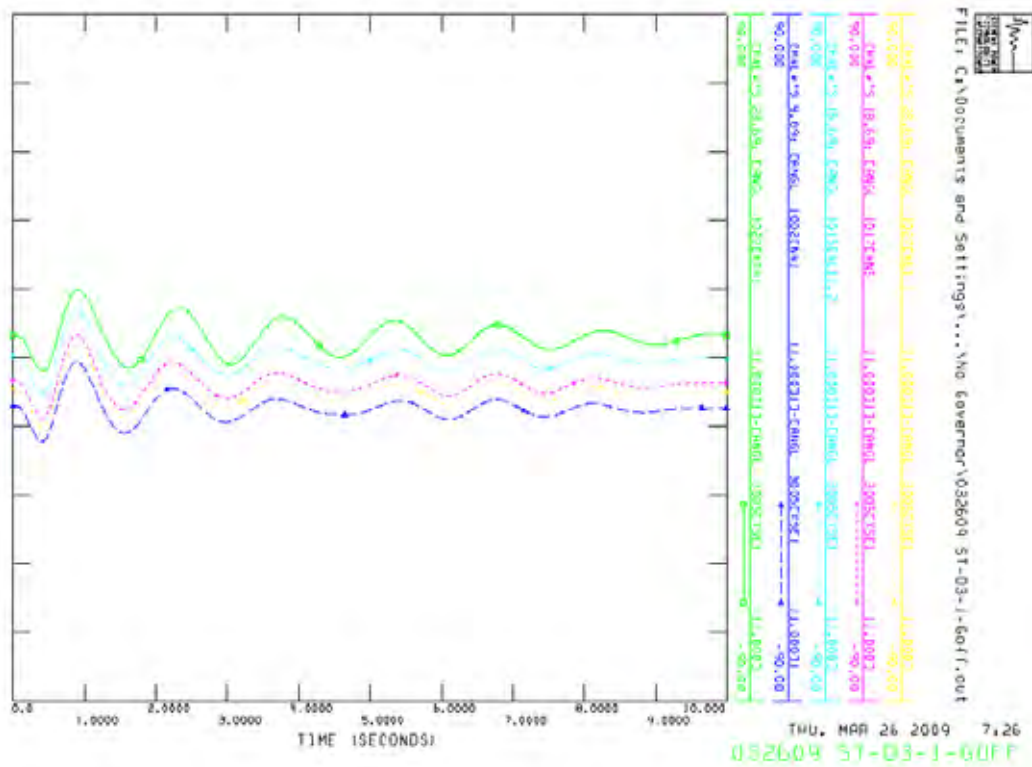
ST-D2-1 Year 2016 (Dry Season)

Bus Fault: Ban Jianxai, Trip: Ban Jianxai - Napong

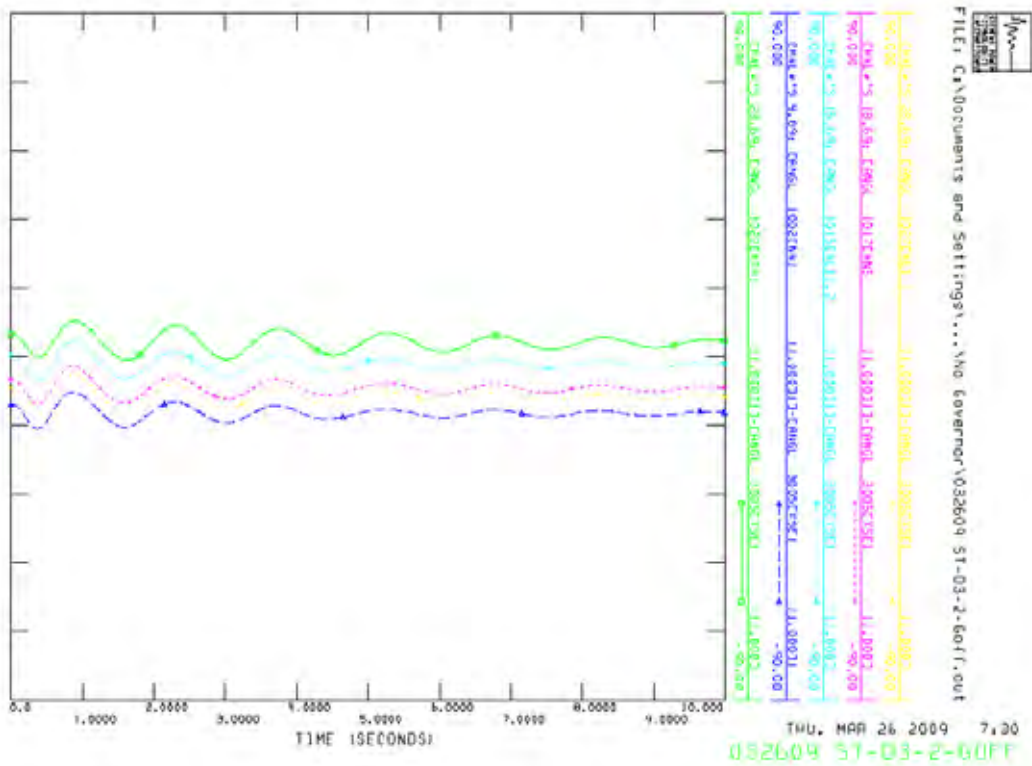


ST-D2-2 Year 2016 (Dry Season)

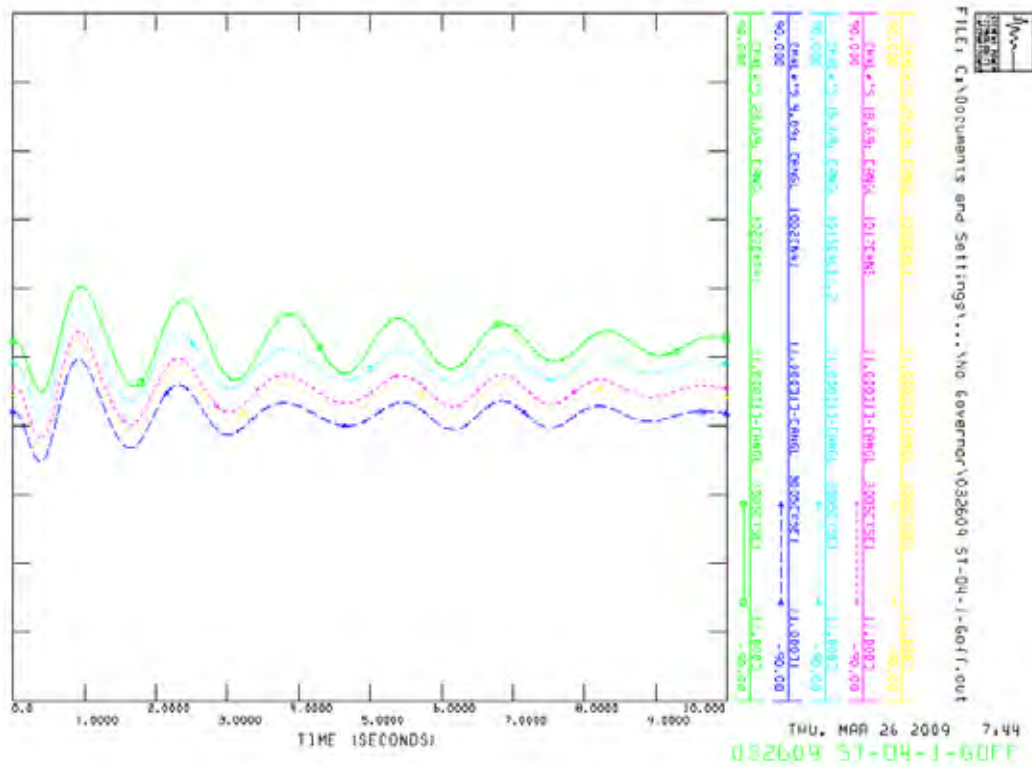
Bus Fault: Naponng, Trip: Naponng - Kengkok



ST-D3-1 Year 2016 (Dry Season)
Bus Fault: Saravan, Trip: Saravan - Napong

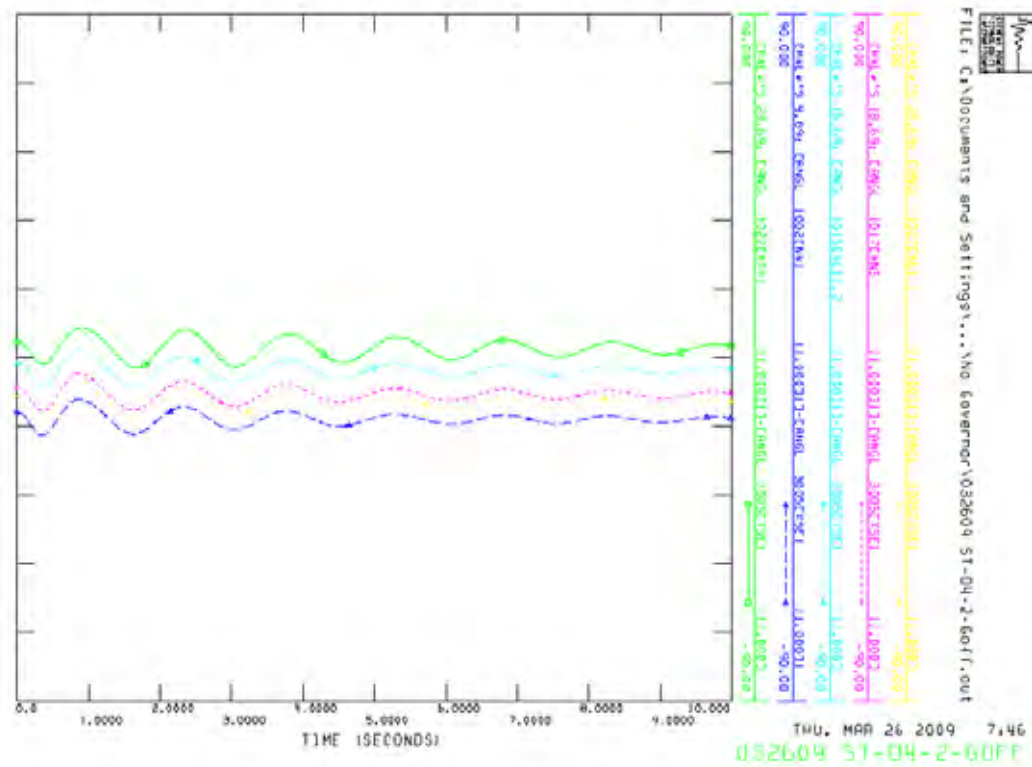


ST-D3-2 Year 2016 (Dry Season)
Bus Fault: Napong, Trip: Napong - Pakbo



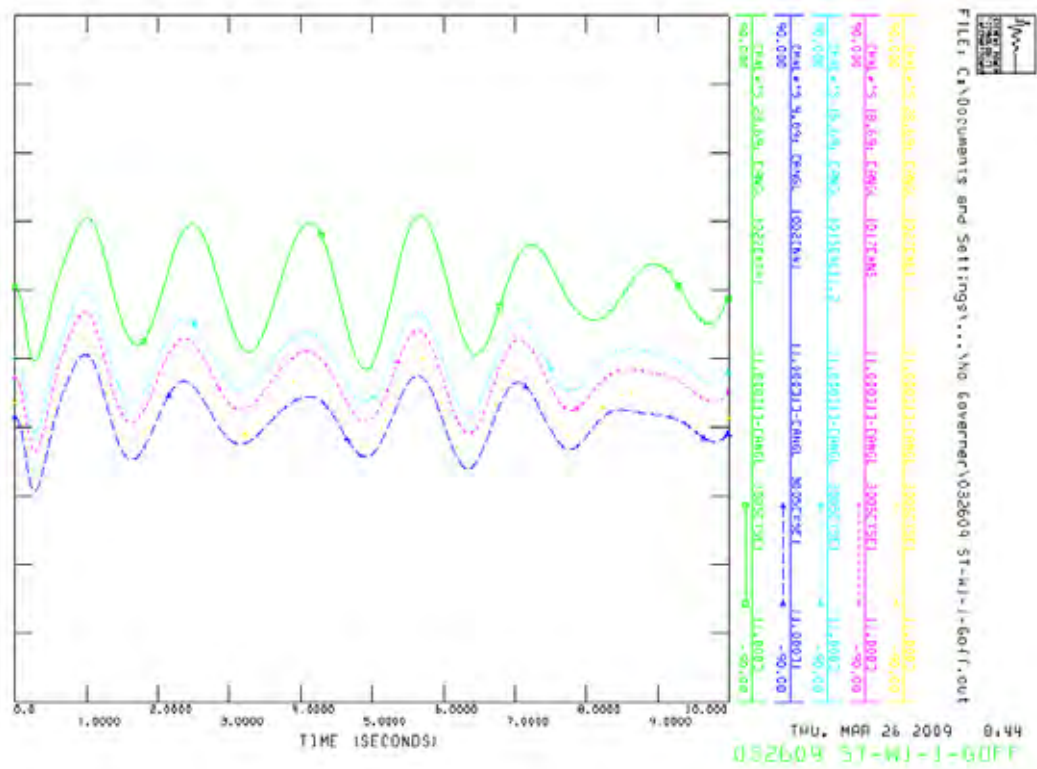
ST-D4-1 Year 2016 (Dry Season)

Bus Fault: Ban Jianxai, Trip: Ban Jianxai - Napong



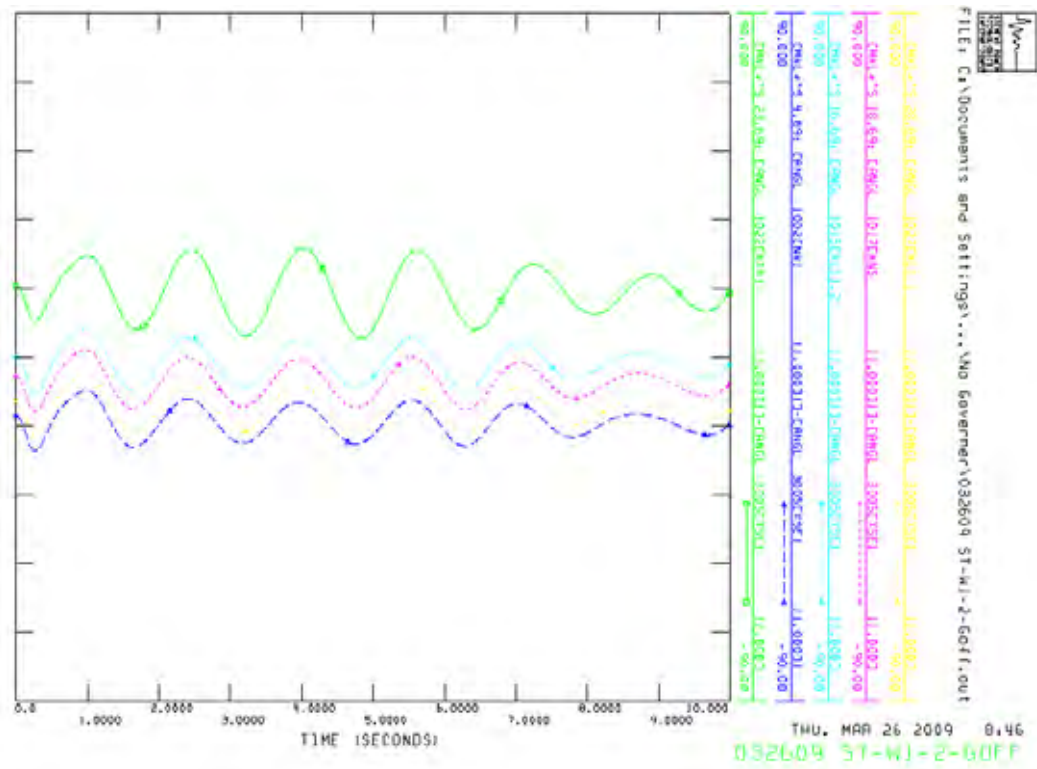
ST-D4-2 Year 2016 (Dry Season)

Bus Fault: Naponng, Trip: Naponng - Pakbo



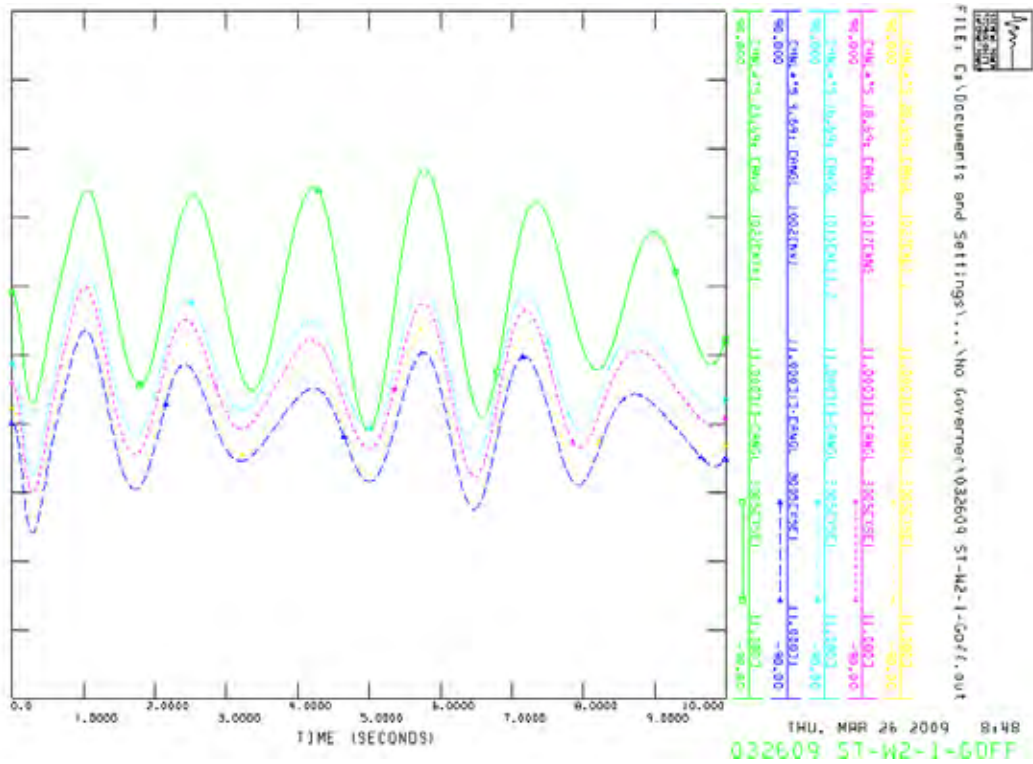
ST-W1-1 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Saravan, Trip: Saravan - Napong



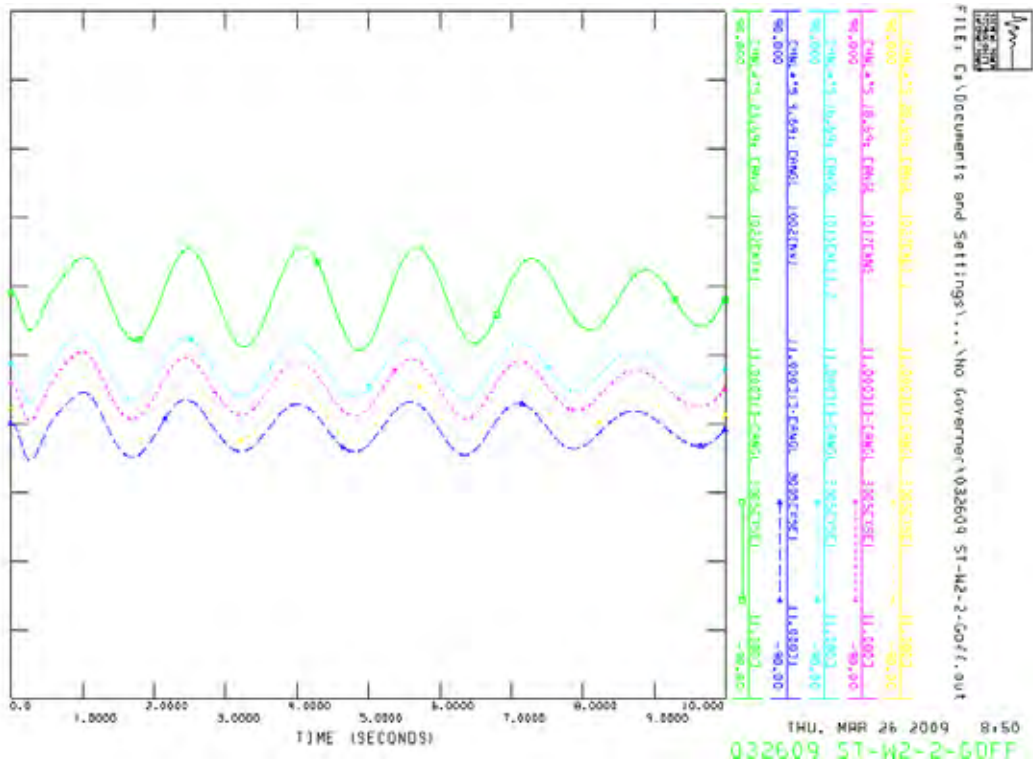
ST-W1-2 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Napong, Trip: Napong - Kengkok



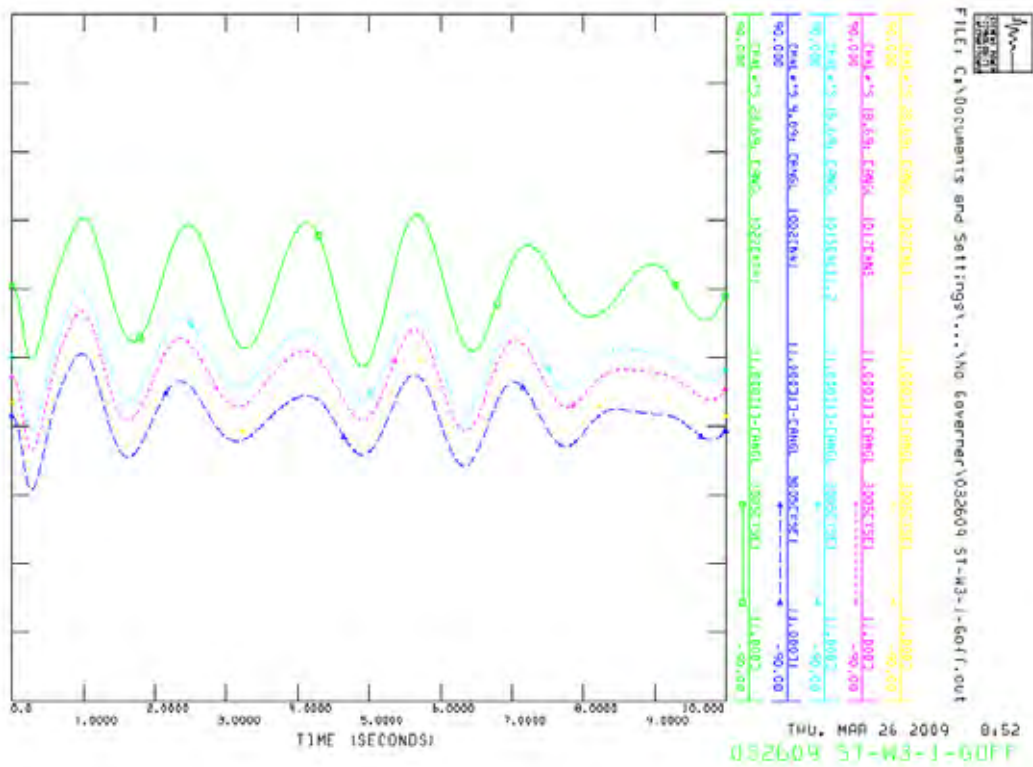
ST-W2-1 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Ban Jianxai, Trip: Ban Jianxai - Napong



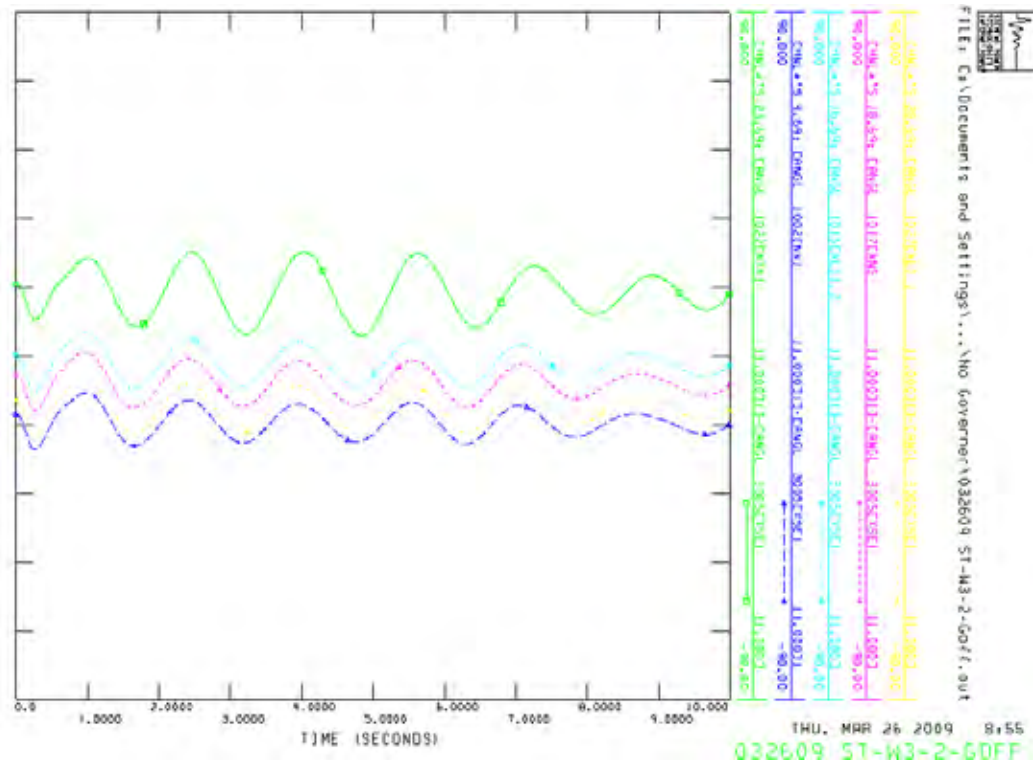
ST-W2-2 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Naponng, Trip: Naponng - Kengkok



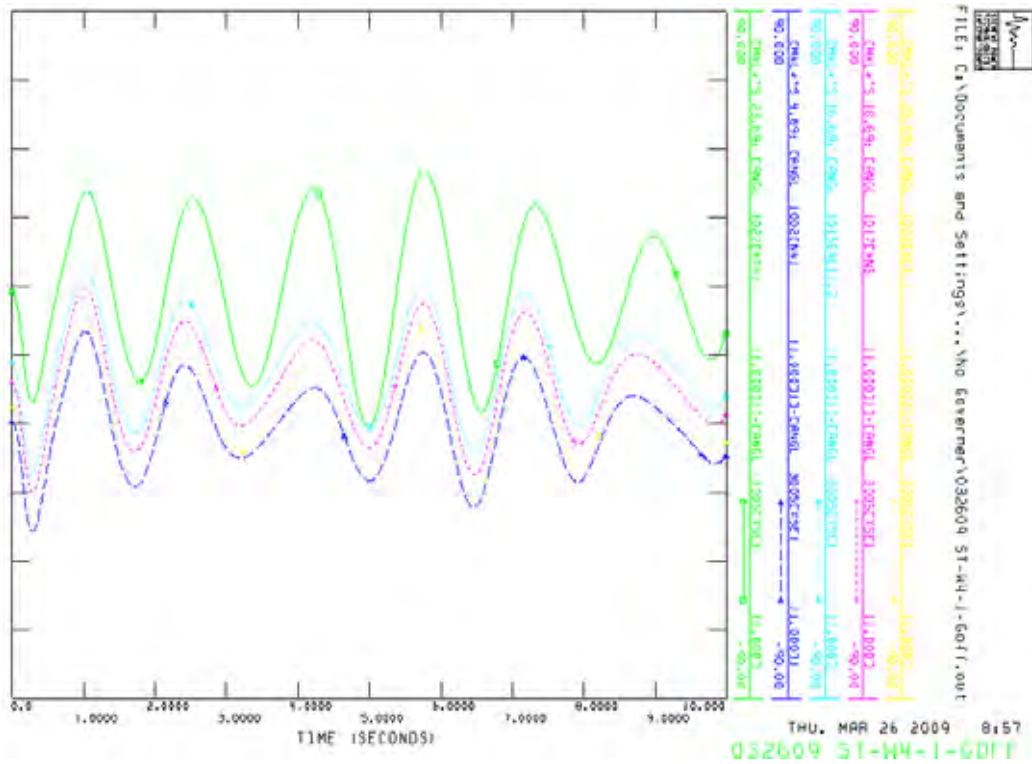
ST-W3-1 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Saravan, Trip: Saravan - Napong



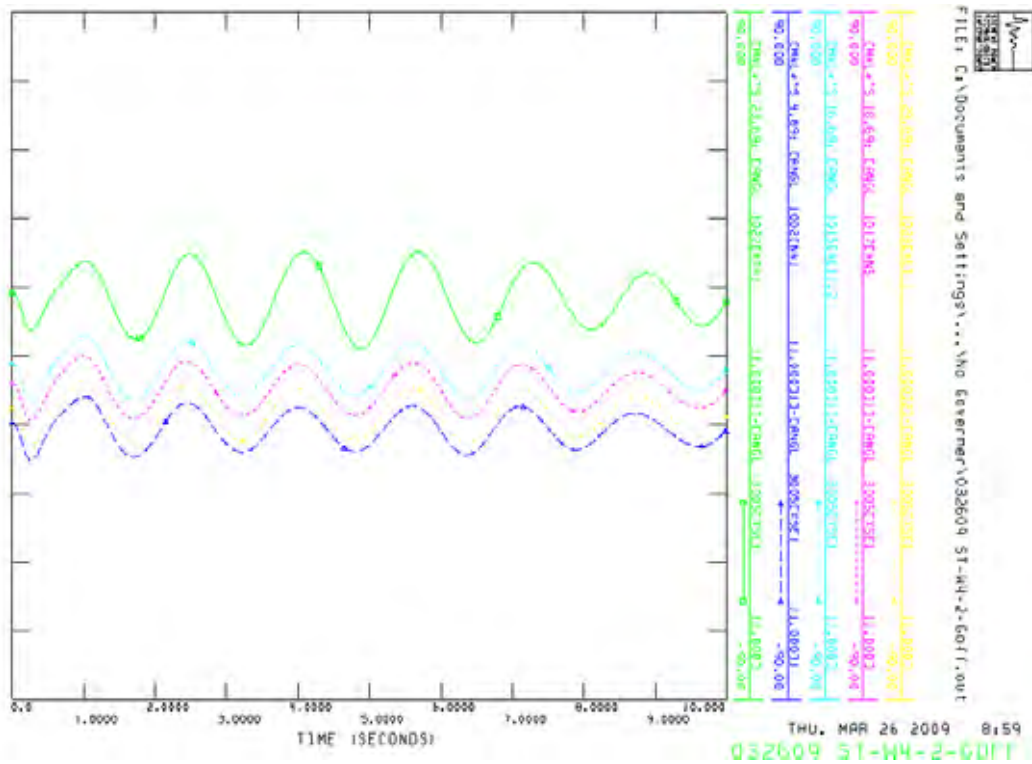
ST-W3-2 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Napong, Trip: Napong - Pakbo



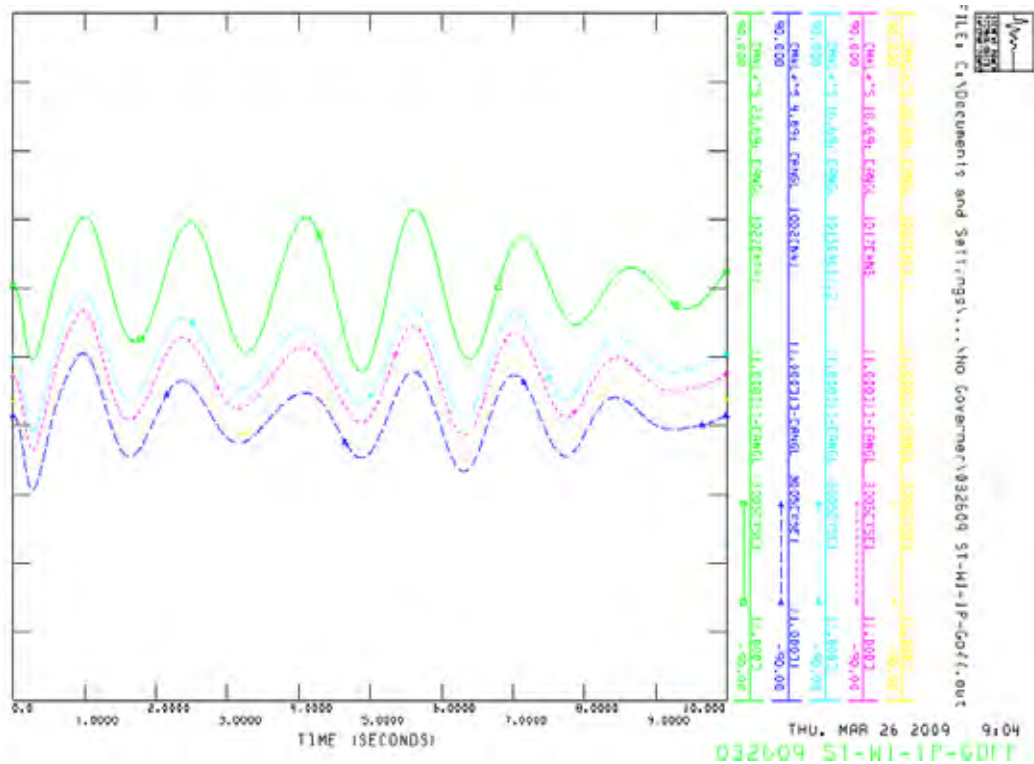
ST-W4-1 Year 2016 (Wet Season, Southern Area Generator Output 80%)

Bus Fault: Ban Jianxai, Trip: Ban Jianxai - Napong

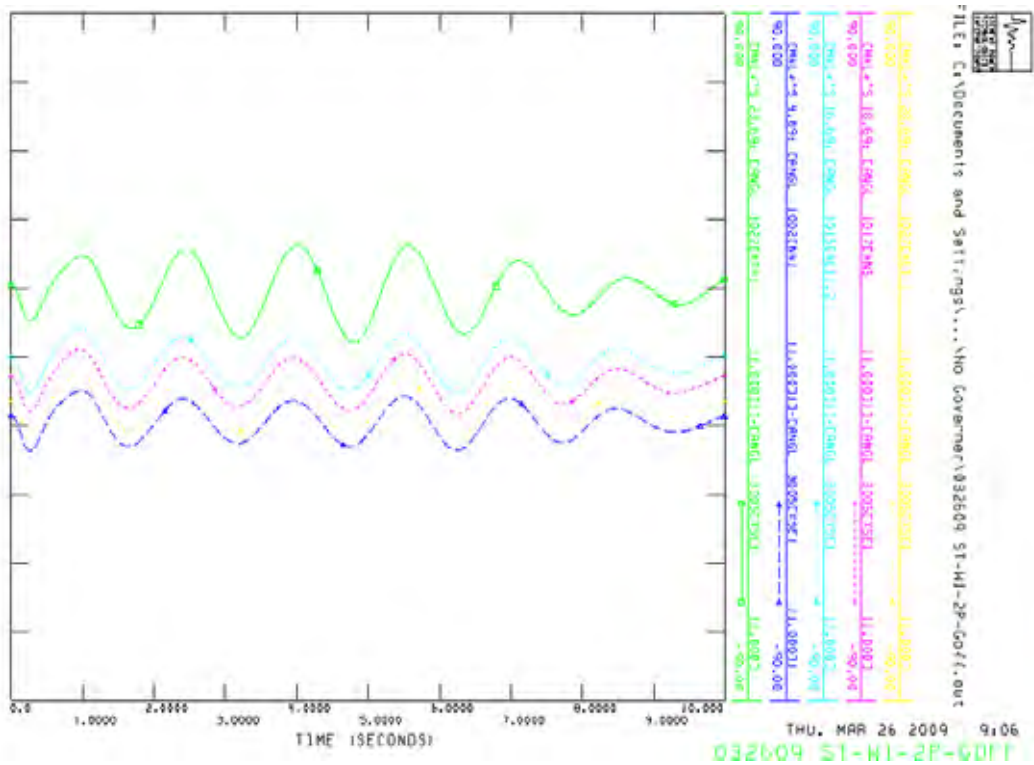


ST-W4-2 Year 2016 (Wet Season, Southern Area Generator Output 80%)

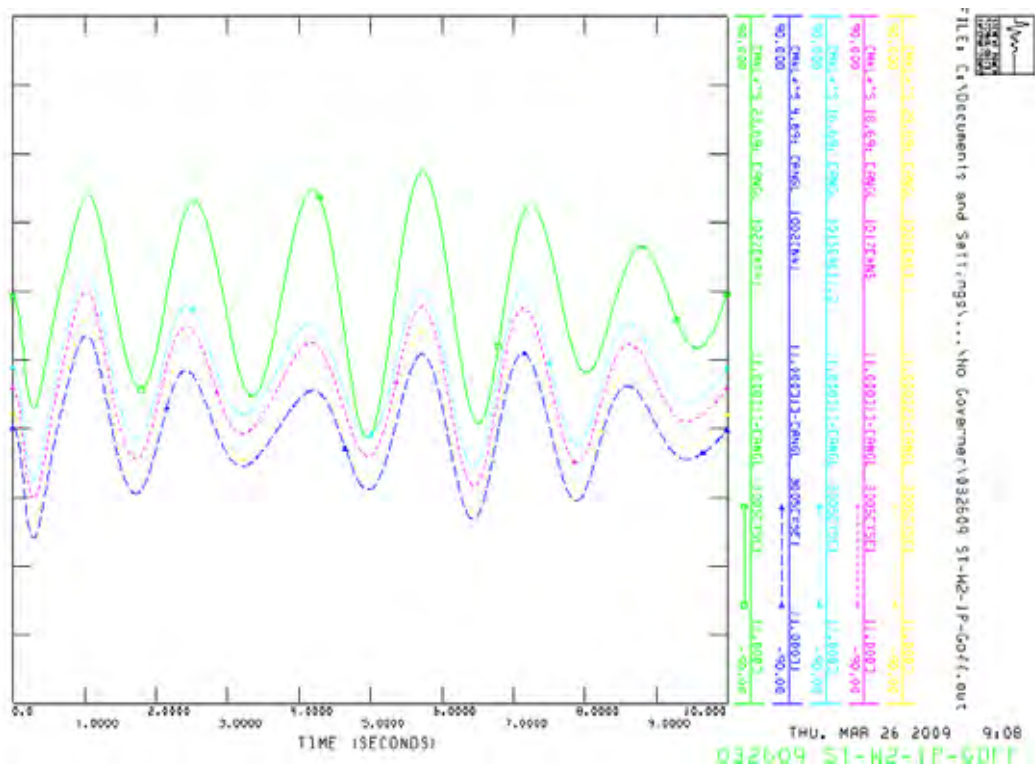
Bus Fault: Napong, Trip: Napong - Pakbo



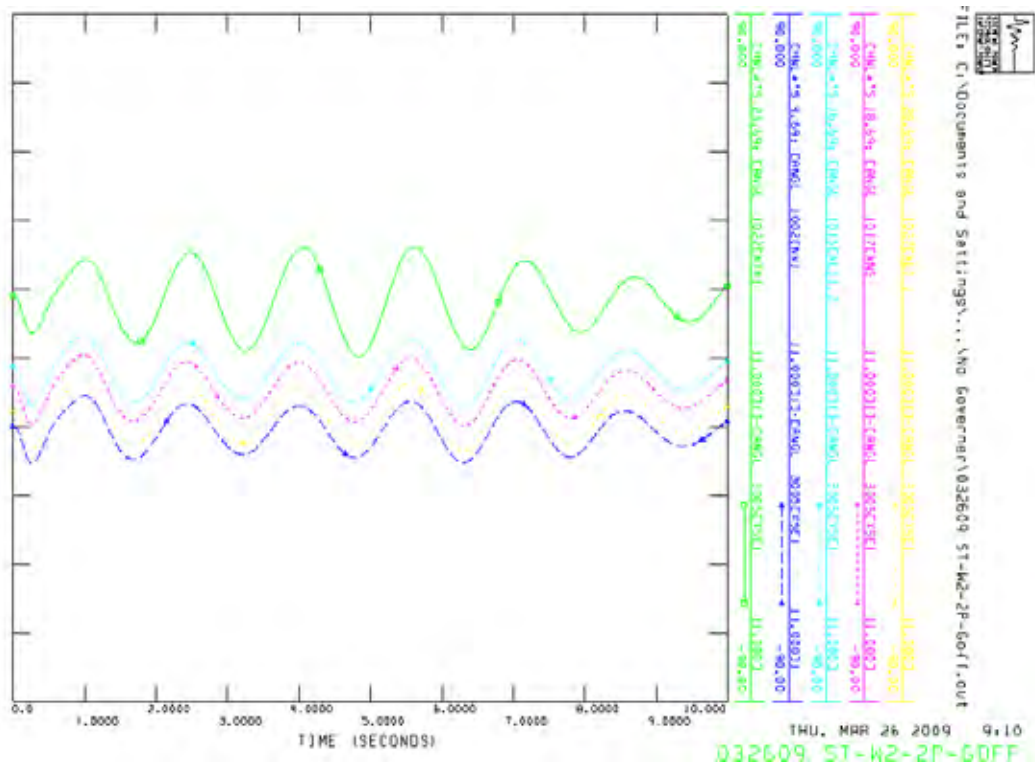
ST-W1-1P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Saravan, Trip: Saravan - Napong



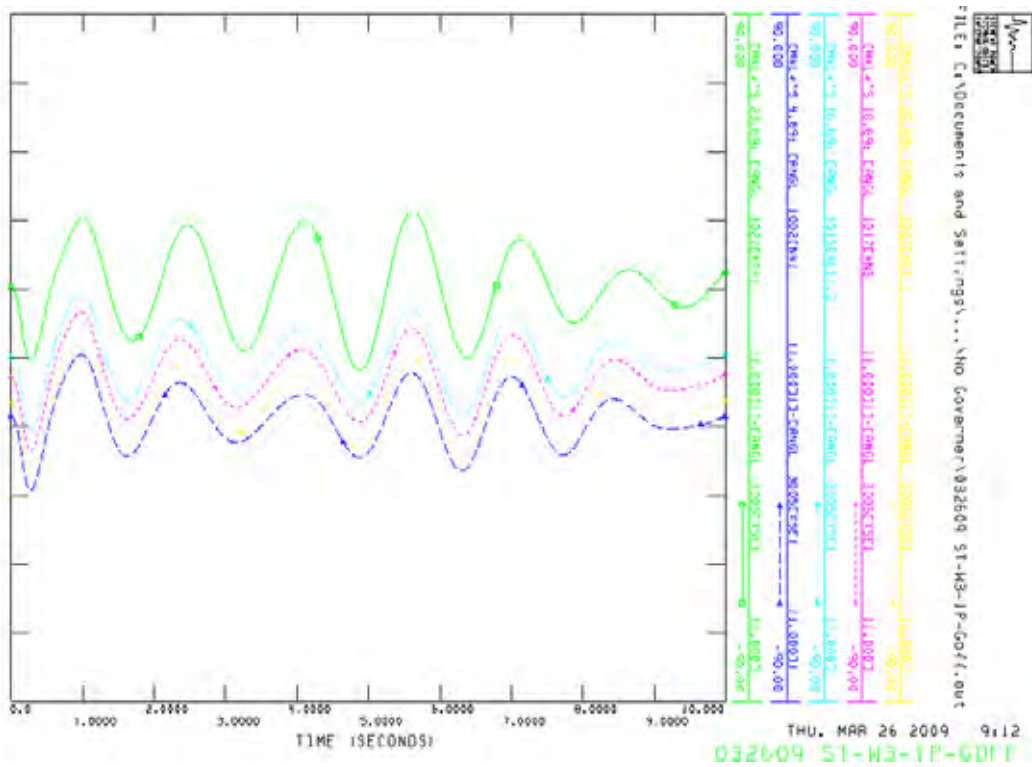
ST-W1-2P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Napong, Trip: Napong - Kengkok



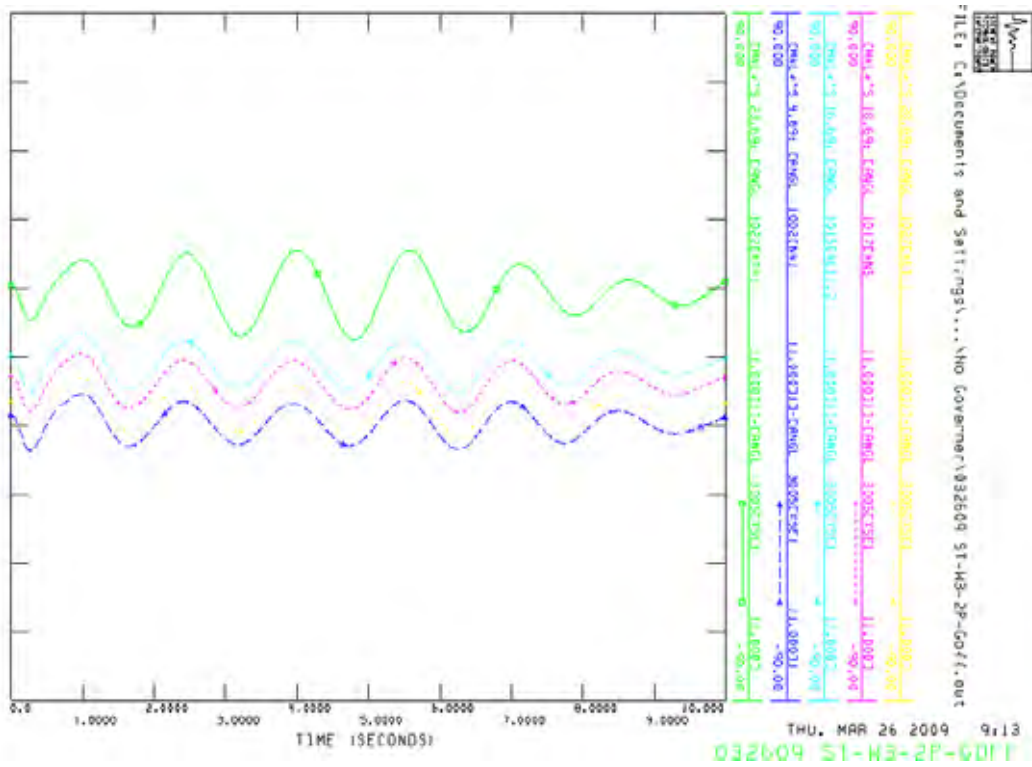
ST-W2-1P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Ban Jianxai, Trip: Ban Jianxai - Napong



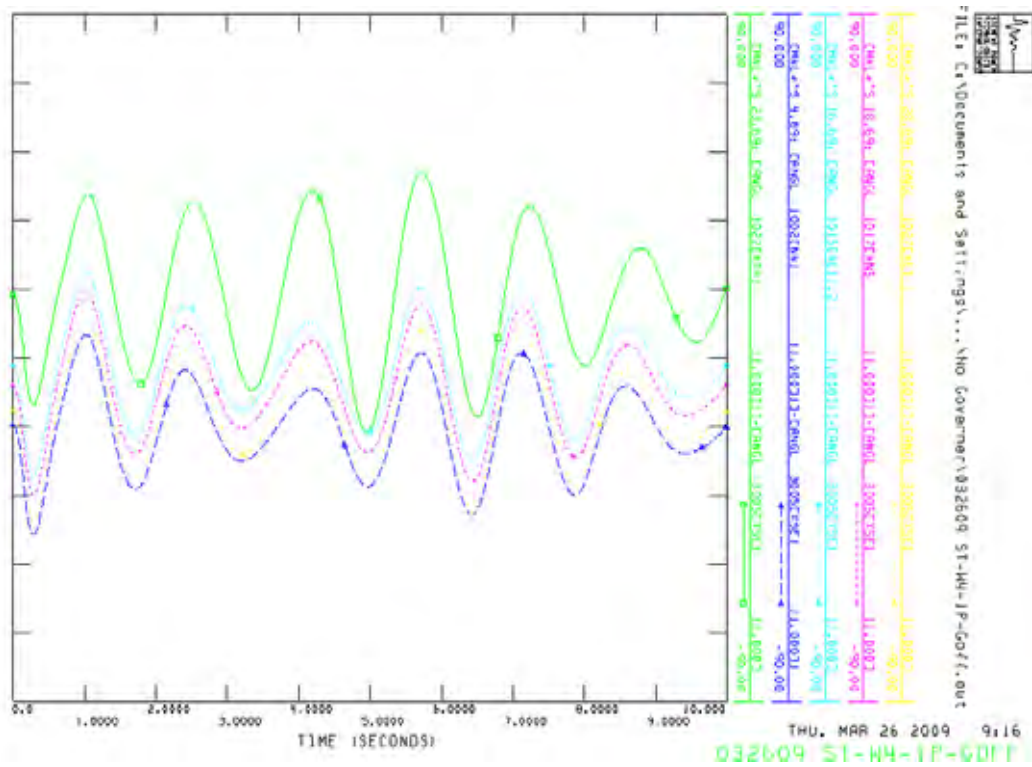
ST-W2-2P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Napong, Trip: Napong - Kengkok



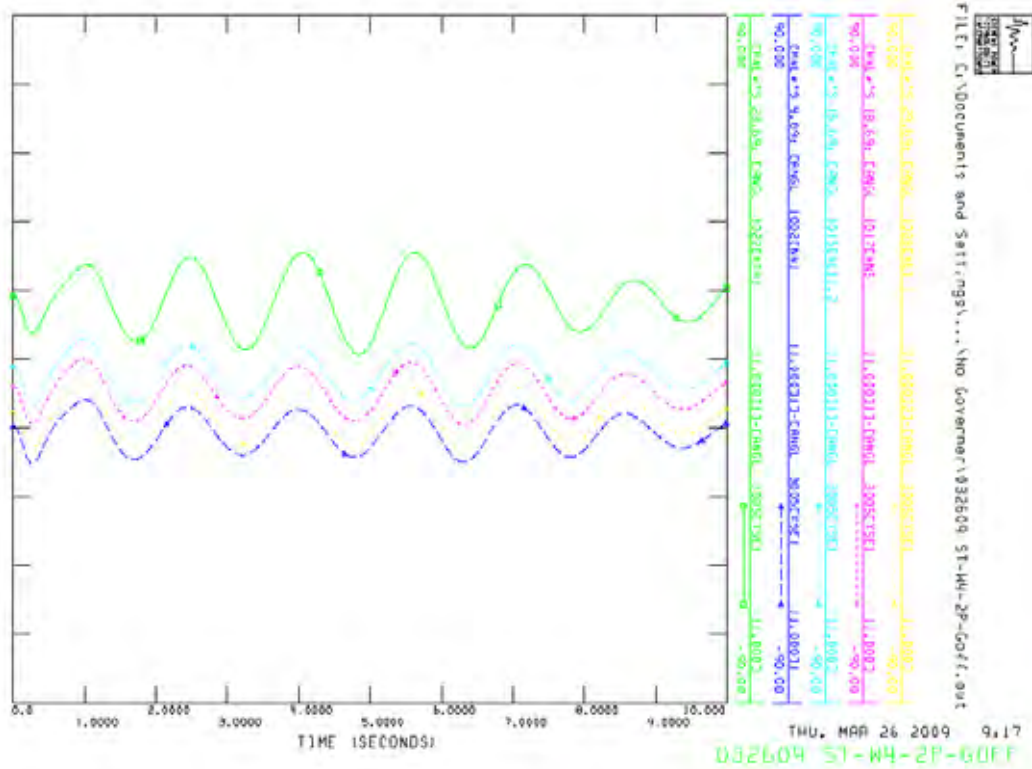
**ST-W3-1P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Saravan, Trip: Saravan - Napong**



**ST-W3-2P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Napong, Trip: Napong - Pakbo**



**ST-W4-1P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Ban Jianxai, Trip: Ban Jianxai - Napong**



**ST-W4-2P Year 2016 (Wet Season, Southern Area Generator Output 80%) with PSS
Bus Fault: Napong, Trip: Napong - Pakbo**

Appendix 9

Laos Transmission System in 2016, 2020 and 2030



0 50 100 Km

LEGEND

- 115 kV TL (existing)
- - - 115 kV TL (U/C or committed)
- 115 kV TL (planned)
- 230 kV TL (existing)
- - - 230 kV TL (U/C or committed)
- 230 kV TL (planned)
- 500 kV TL (existing)
- - - 500 kV TL (U/C or committed)
- 500 kV TL (planned)
- HPP (existing:U/C or planned)
- Substations (- ditto -)
(*P: private substation)
- Switching Stations (- ditto -)
- Thermal PS (planned)



Laos Transmission System in 2016



0 50 100 Km

LEGEND

- 115 kV TL (existing)
- 115 kV TL (U/C or committed)
- 115 kV TL (planned)
- 230 kV TL (existing)
- 230 kV TL (U/C or committed)
- 230 kV TL (planned)
- 500 kV TL (existing)
- 500 kV TL (U/C or committed)
- 500 kV TL (planned)
- HPP (existing:U/C or planned)
- Substations (- ditto -)
(*P: private substation)
- Switching Stations (- ditto -)
- Thermal PS (planned)



Laos Transmission System in 2020



0 50 100 Km

LEGEND

- 115 kV TL (existing)
- - - 115 kV TL (U/C or committed)
- ⋯ 115 kV TL (planned)
- 230 kV TL (existing)
- - - 230 kV TL (U/C or committed)
- ⋯ 230 kV TL (planned)
- 500 kV TL (existing)
- - - 500 kV TL (U/C or committed)
- ⋯ 500 kV TL (planned)
- HPP (existing:U/C or planned)
- Substations (- ditto -)
(*P: private substation)
- Switching Stations (- ditto -)
- Thermal PS (planned)



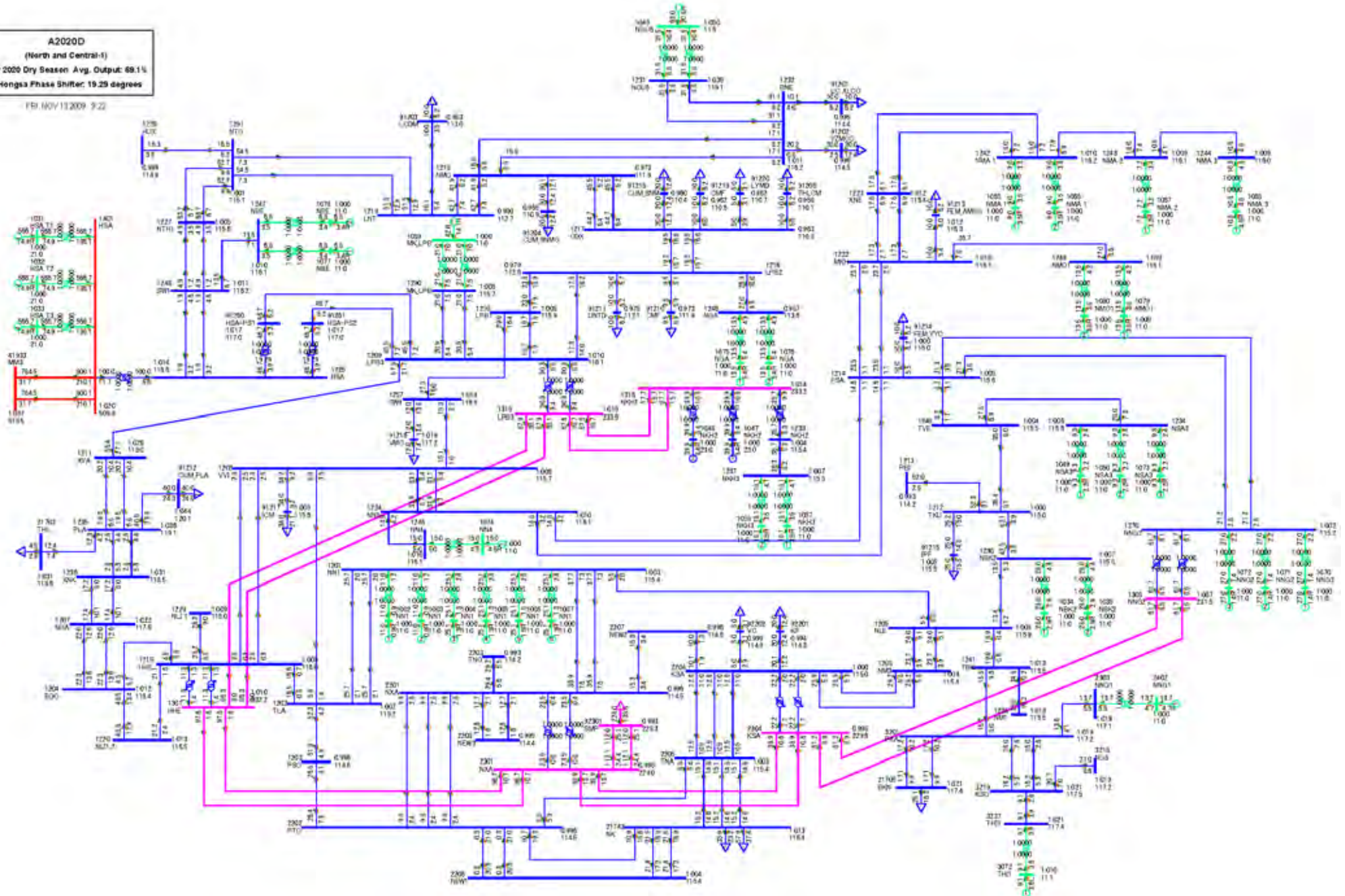
Laos Transmission System in 2030

Appendix 9.6-1

Power Flow Diagram

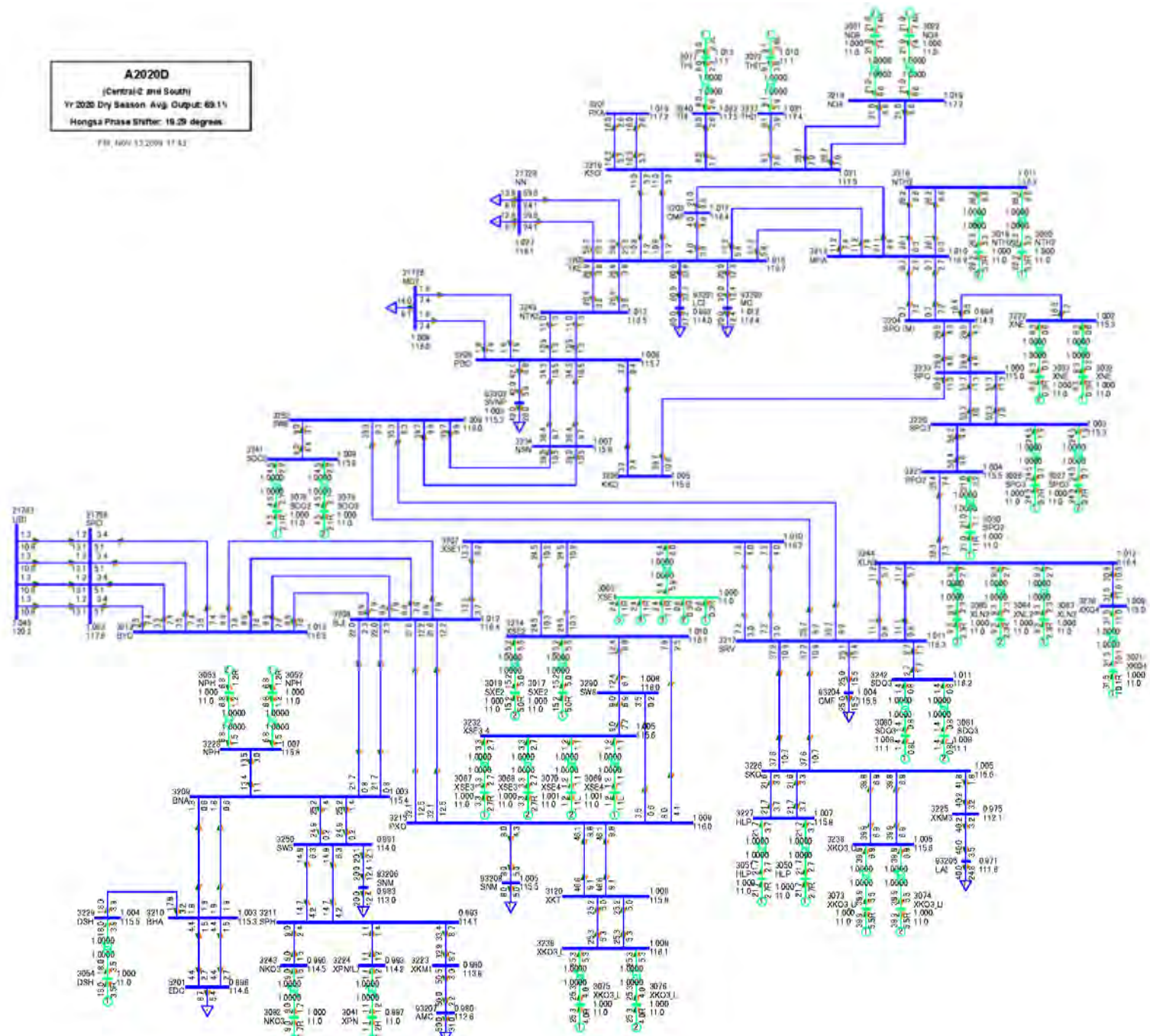
A2020D
 (North and Central-1)
 Yr 2020 Dry Season Avg. Output: 69.1%
 Hongsa Phase Shifter: 19.25 degrees

Fri, Nov 13 2009 9:22



Power Flow and Voltage Analysis Result in 2020 (Dry Season: North and Central-1Areas)

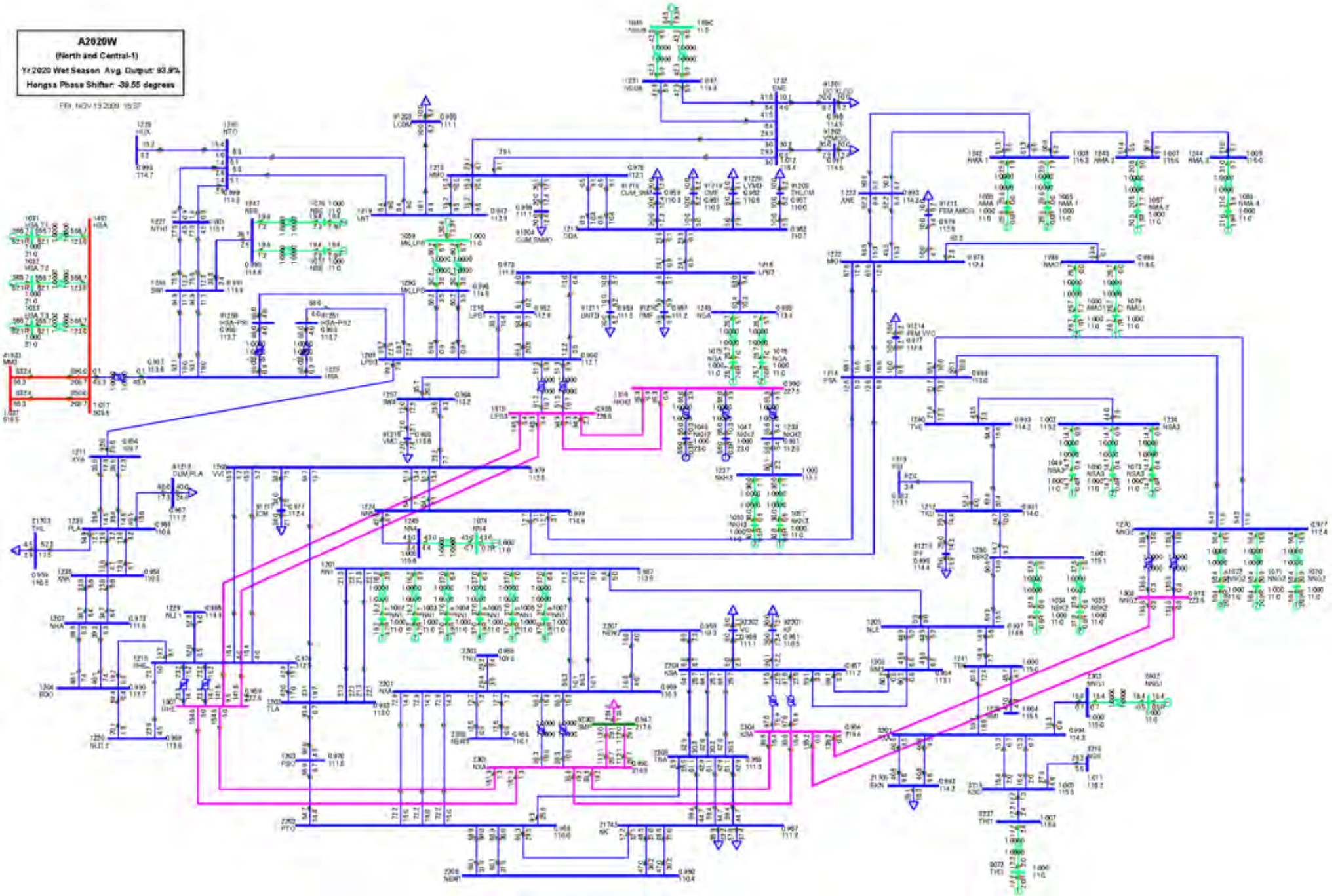
A2020D
 (Central-2 and South)
 Yr 2020 Dry Season Avg. Output: 69.1%
 HongKong Phase Shift: 19.29 degrees
 FR: 60V 53.2009 17.43



Power Flow and Voltage Analysis Result in 2020 (Dry Season: Central-2 and South Areas)

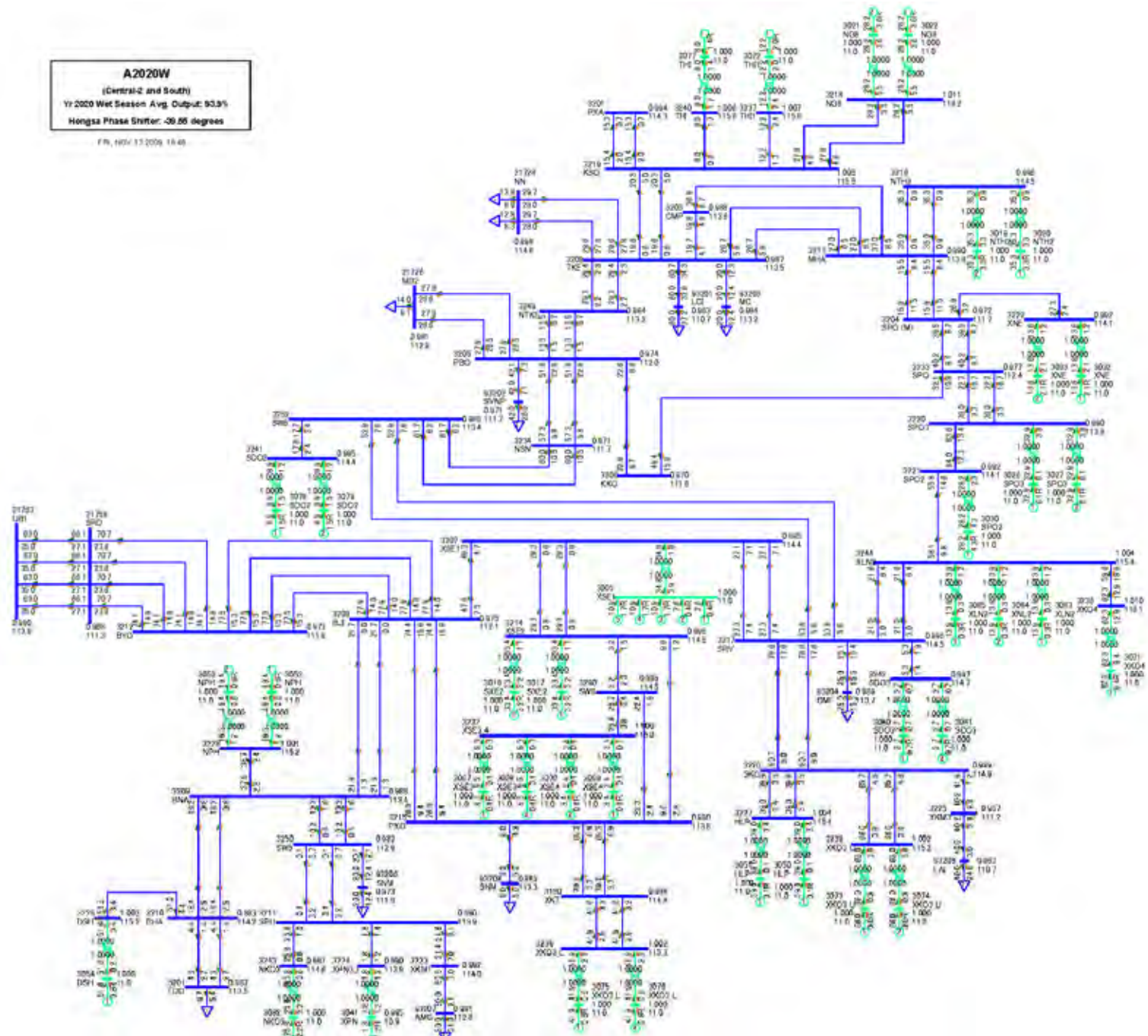
A2020W
 (North and Central-1)
 Yr 2020 Wet Season Avg. Output: 93.5%
 Hongsa Phase Shift: -39.55 degrees

Fri, Nov 13 2009 15:37



Power Flow and Voltage Analysis Result in 2020 (Wet Season: North and Central-1Areas)

A2020W
 (Central-2 and South)
 Yr 2020 Wet Season Avg. Output: 93.9%
 Hongsa Phase Shifter: -36.85 degrees
 FR, 16/11/17 20:09 16.48



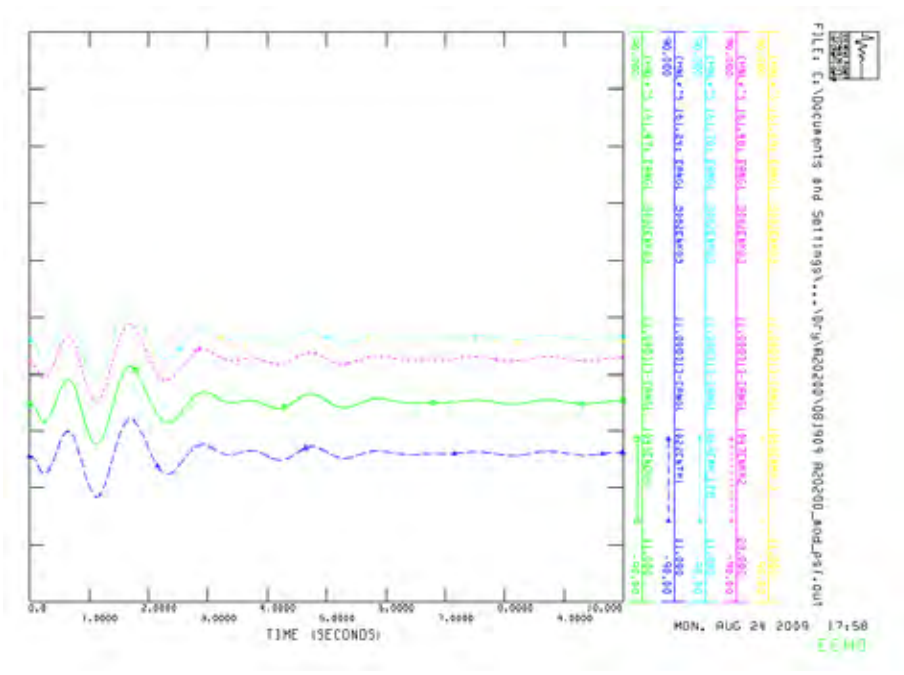
Power Flow and Voltage Analysis Result in 2020 (Wet Season: Central-2 and South Areas)

Appendix 9.6-2

Stability Analysis Results (Phase Angle Oscillation Waveforms) (2020 and 2030)

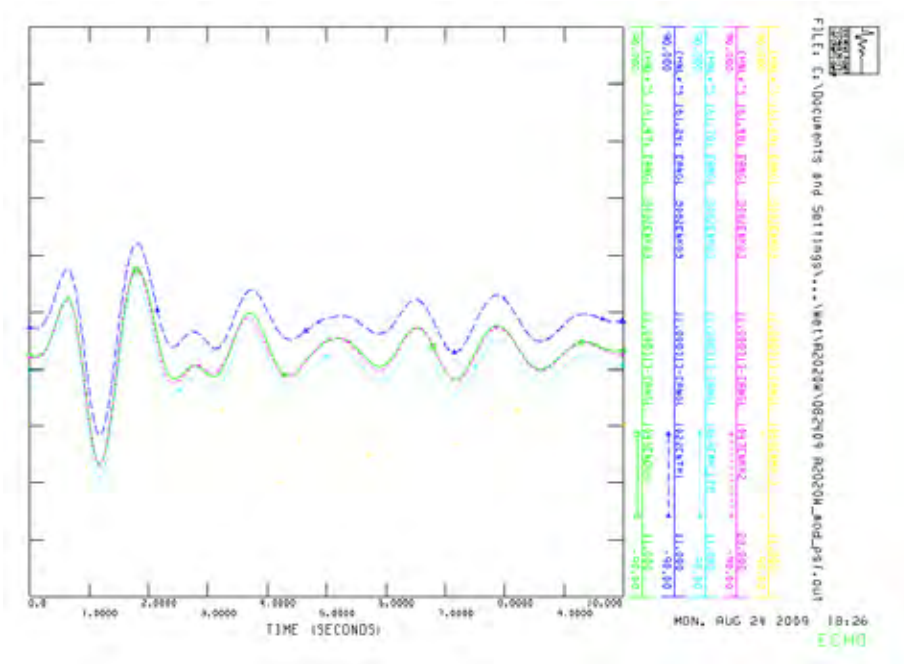
Behaviors of phase difference angle oscillation between primary generators in Northern and Central-1 areas and Nam Kong 3 (Southern area)

- Green : Nam Ou 6
- Dark Blue : Nam Tha 1
- Light Blue : Mekong Luangprabang
- Pink : Nam Khan 2
- Yellow : Nam Ma 3



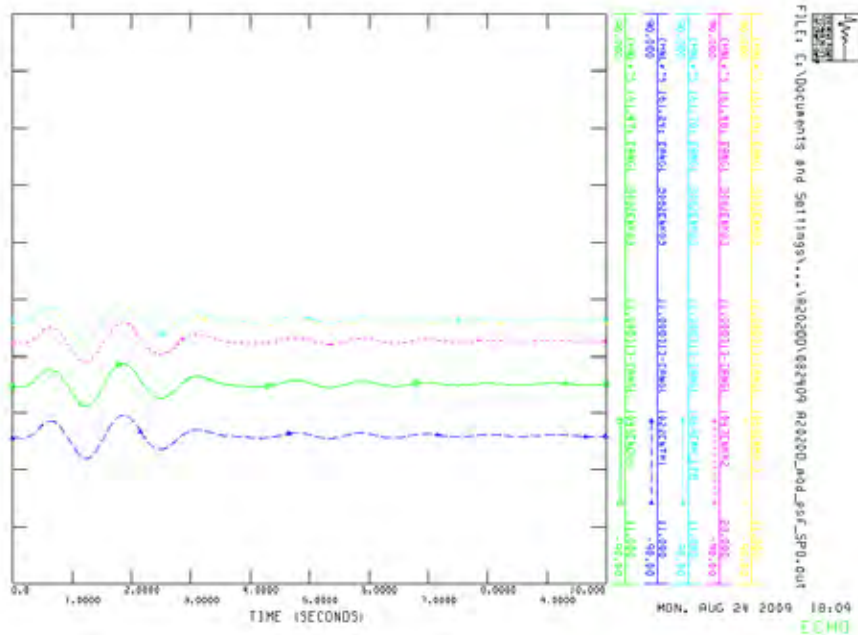
ST-D1 Year 2020 (Dry Season)

Fault Section: Saravan – Nongsano 115kV 1cct

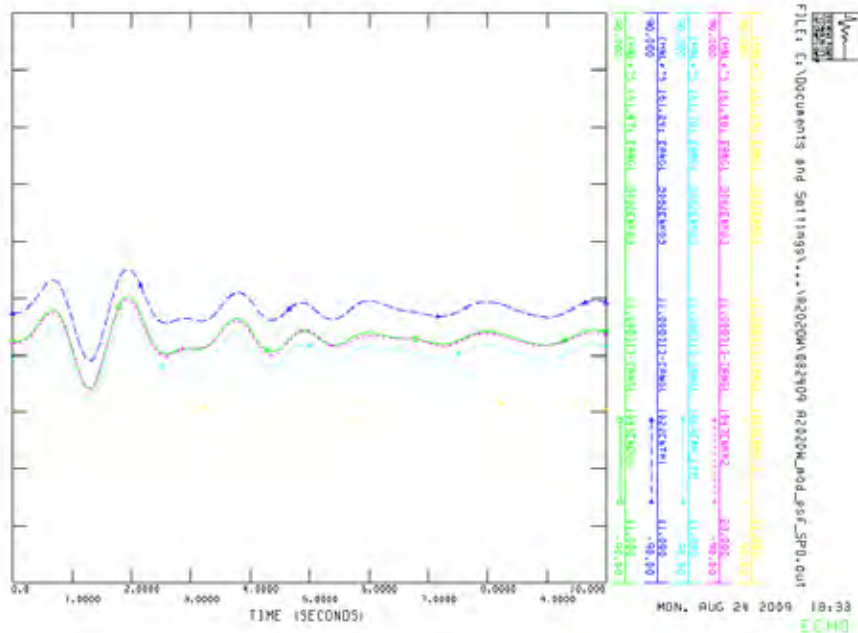


ST-W1 Year 2020 (Wet Season)

Fault Section: Saravan – Nongsano 115kV 1cct



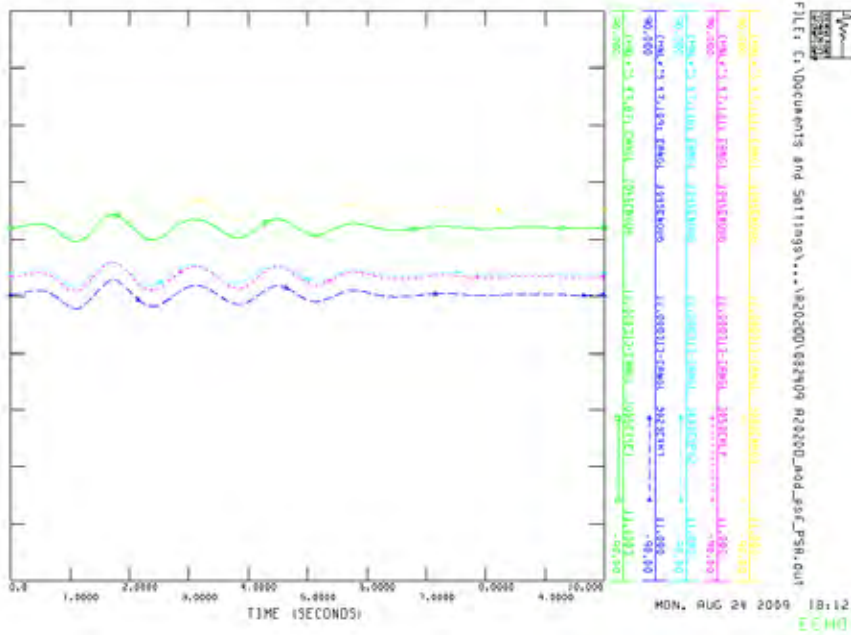
ST-D2 Year 2020 (Dry Season)
Fault Section: Sepon – Sepon 3 115kV 1cct



ST-W2 Year 2020 (Wet Season)
Fault Section: Sepon – Sepon 3 115kV 1cct

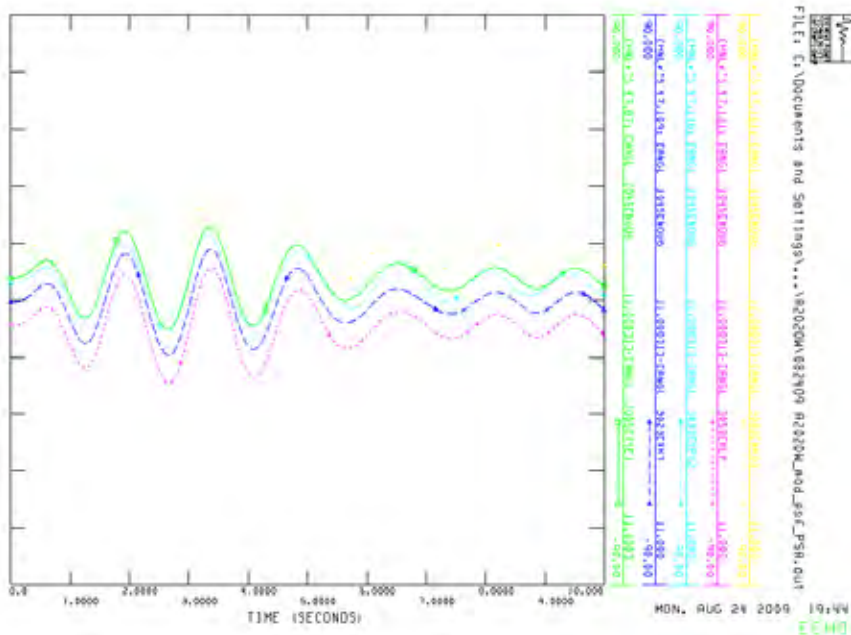
Behaviors of phase difference angle oscillation between primary generators in South areas and Nam Ou 6 (North area)

- Green : Xeset 1
- Dark Blue : Xekatam
- Light Blue : Xepon 2
- Pink : Houaylamphan
- Yellow : Nam Kong 3



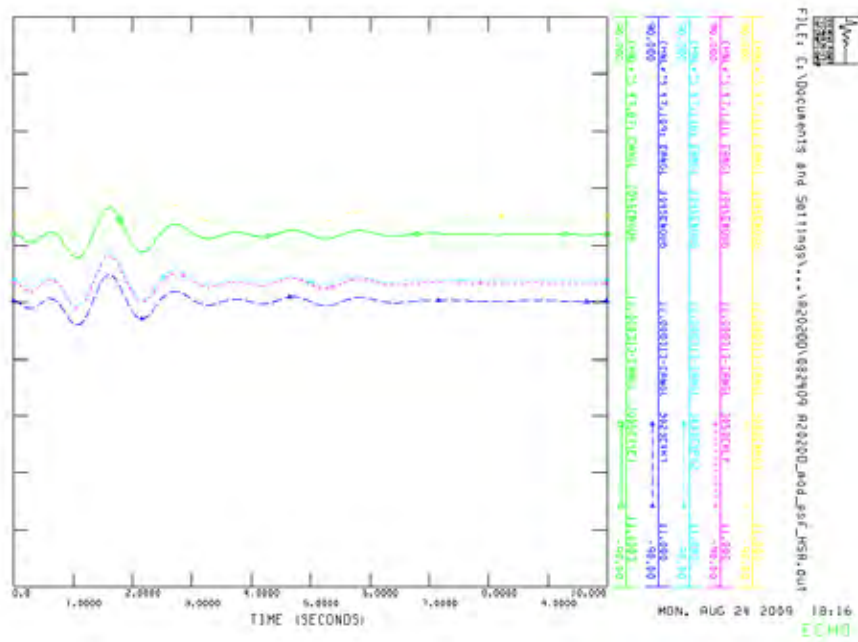
ST-D3 Year 2020 (Dry Season)

Fault Section: Phonsavan – Nam Ngiep 2 115kV 1cct



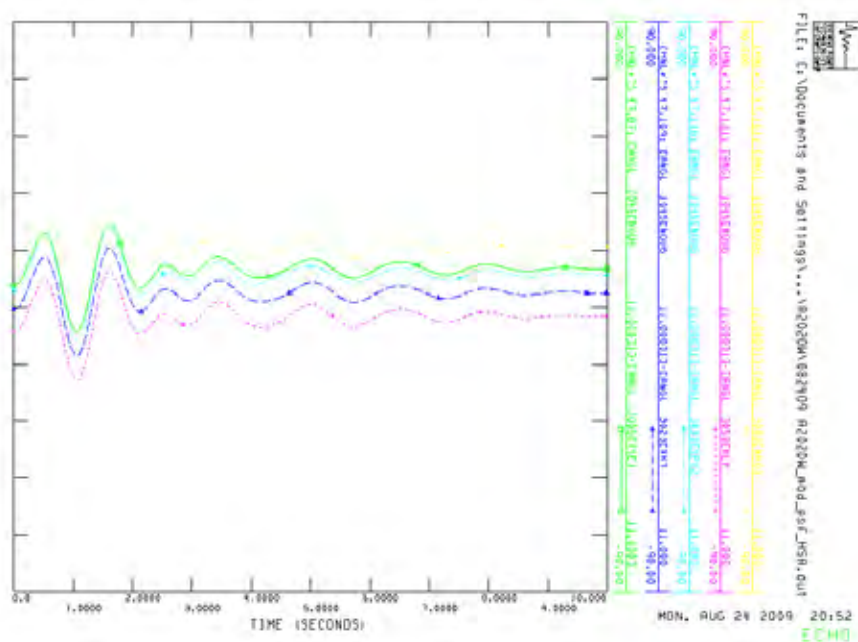
ST-W3 Year 2020 (Wet Season)

Fault Section: Phonsavan – Nam Ngiep 2 115kV 1cct



ST-D4 Year 2020 (Dry Season)

Fault Section: Hongsa – Switching Station – Nam Tha 1 115kV 1cct

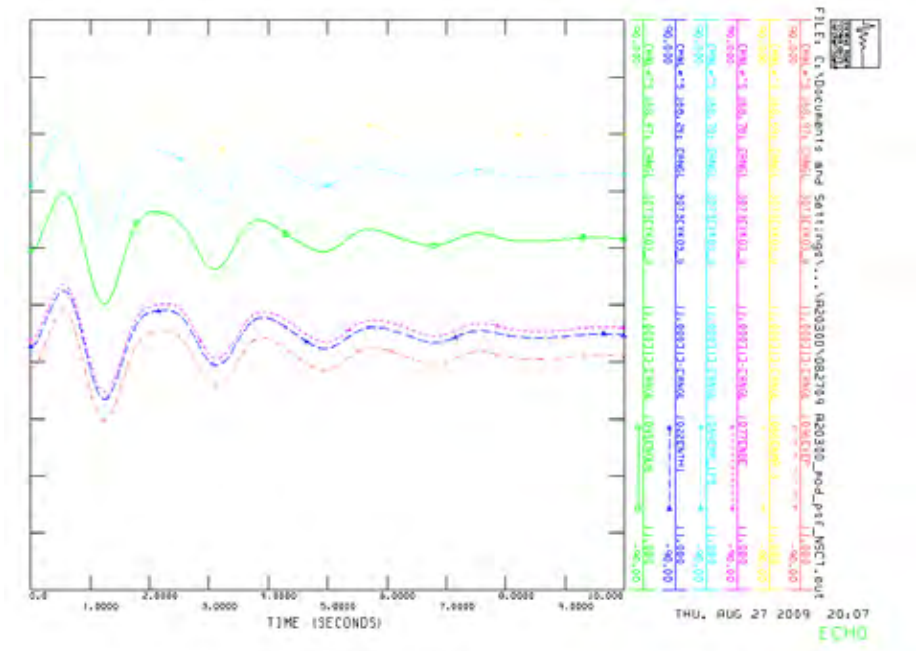


ST-W4 Year 2020 (Wet Season)

Fault Section: Hongsa – Switching Station – Nam Tha 1 115kV 1cct

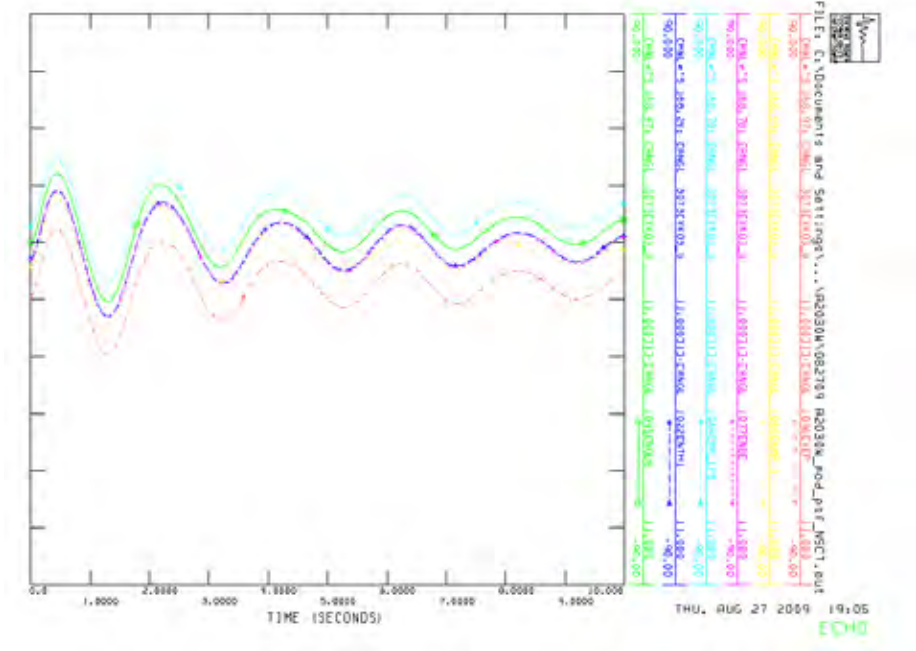
Behaviors of phase difference angle oscillation between primary generators in Northern and Central-1 areas and Xekong 3 Upper (Southern area)

- Green : Nam Ou 6
- Dark Blue : Nam Tha 1
- Light Blue : Mekong Luangprabang
- Pink : Nam Beng
- Yellow : Nam Ma 3
- Red : Viengphokha



ST-D1-30 Year 2030 (Dry Season)

Fault Section: Kengkok-New Sraavan Coal Thermal P/S 230kV 1cct

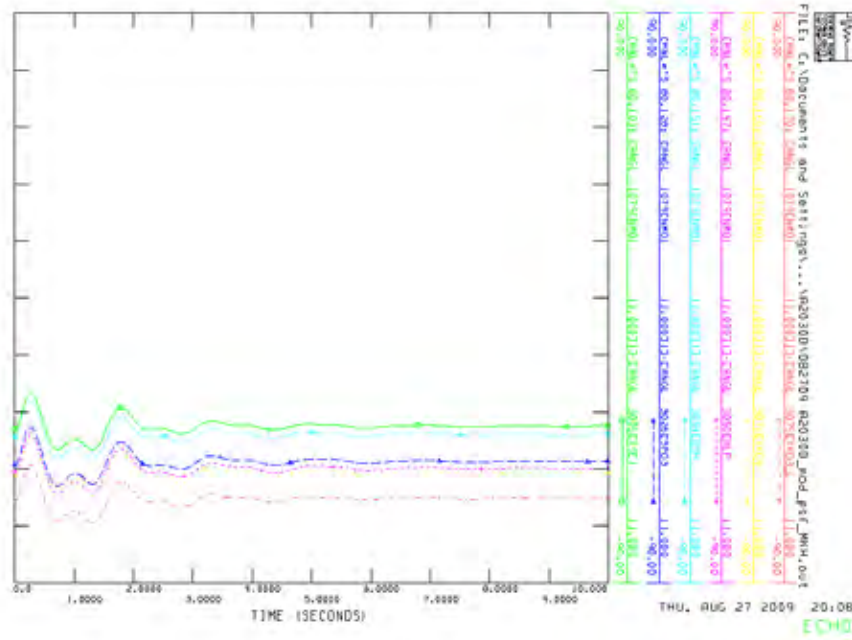


ST-W1-30 Year 2030 (Wet Season)

Fault Section: Kengkok-New Sraavan Coal Thermal P/S 230kV 1cct

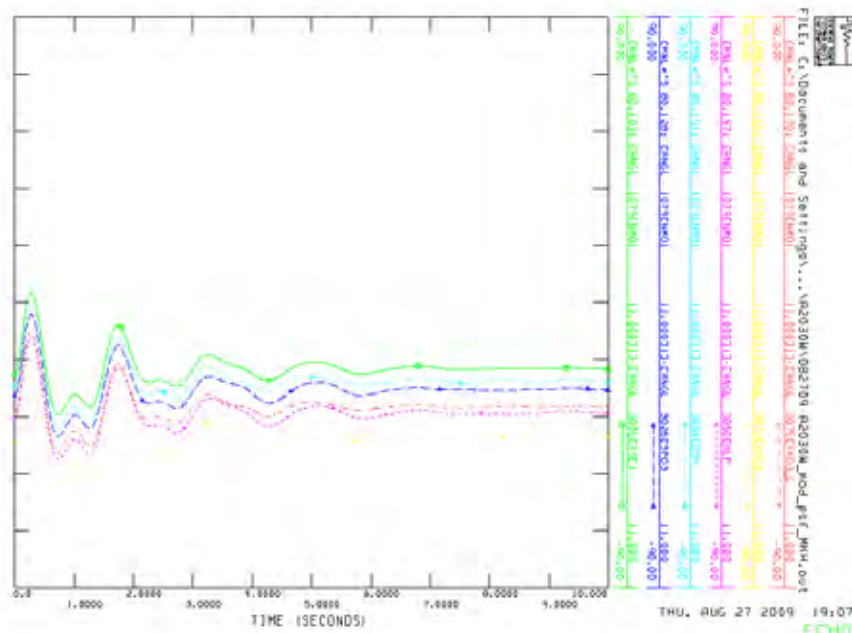
Behaviors of phase difference angle oscillation between primary generators in South areas and Nam Mo (North area)

- Green : Xeset 1
- Dark Blue : Xepon 3
- Light Blue : Donsahong
- Pink : Houaylamphan
- Yellow : Xekong 4
- Red : Xekong 3 Lower



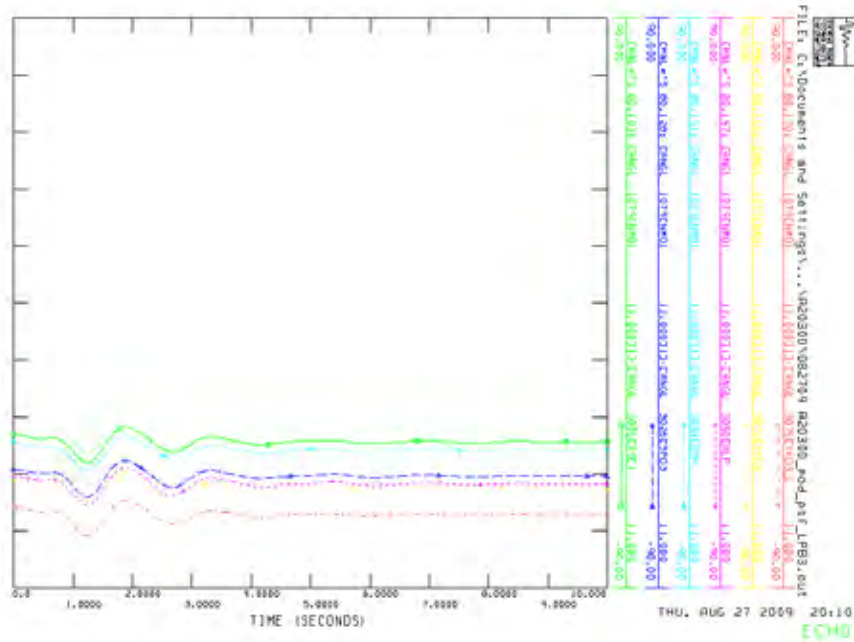
ST-D2-30 Year 2030 (Dry Season)

Fault Section: Muong Kham-Nam Ngiep 2 230kV 1cct



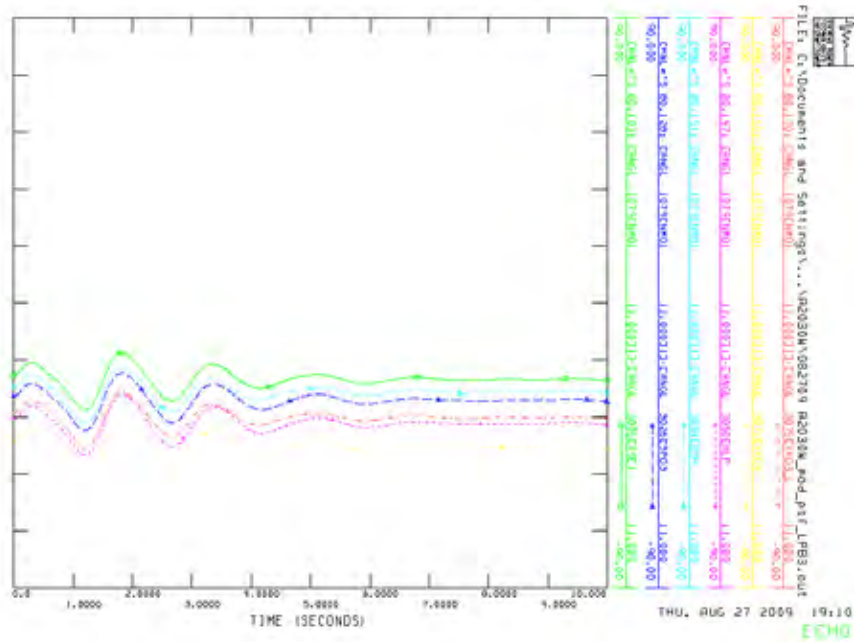
ST-W2-30 Year 2030 (Wet Season)

Fault Section: Muong Kham-Nam Ngiep 2 230kV 1cct



ST-D3-30 Year 2030 (Dry Season)

Fault Section: Luangprabang 3-Hin Heup 230kV 1cct



ST-W3-30 Year 2030 (Wet Season)

Fault Section: Luangprabang 3-Hin Heup 230kV 1cct

Appendix 12

**Photos along the line ruote
Pakbo SS - Taothan SS**

Photos along the line route : Pakbo SS – Taothan SS



Photo-01: Pakbo SS



Photo-02: Planned Special Economic Zone 1

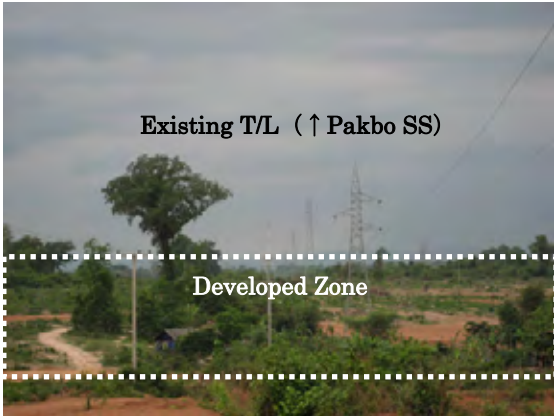


Photo-03: Planned Special Economic Zone 2



Photo-04: New T/L Crossing Point (No.14-15)



Photo-05: Route 5 Crossing Point 1

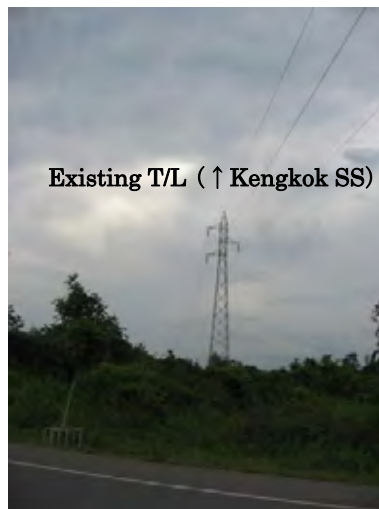


Photo-06: Route 5 Crossing Point 2



Photo-07: Route 9 Crossing Point 1



Photo-08: Route 9 Crossing Point 2



Photo-09: B. Donpho Road Crossing Point 1



Photo-10: Xe Banghieng River Crossing Point 1



Photo-11: West Side of Route 13



Photo-12: Xe Nouan Crossing Point 1



Photo-13: West Side of Route 13



Photo-14: Route 13 Crossing Point 1



Photo-15: Route 13 Crossing Point 2



Photo-16: Site of Taothan SS

Photos along the line route : Taothan SS – Saravan SS



Photo-17: Angle Tower Point Beside Route 15



Photo-18: South Side of Route 15



Photo-19: Route Beside Xedon River



Photo-20: Xedon River Crossing Point (Span: 600 m)

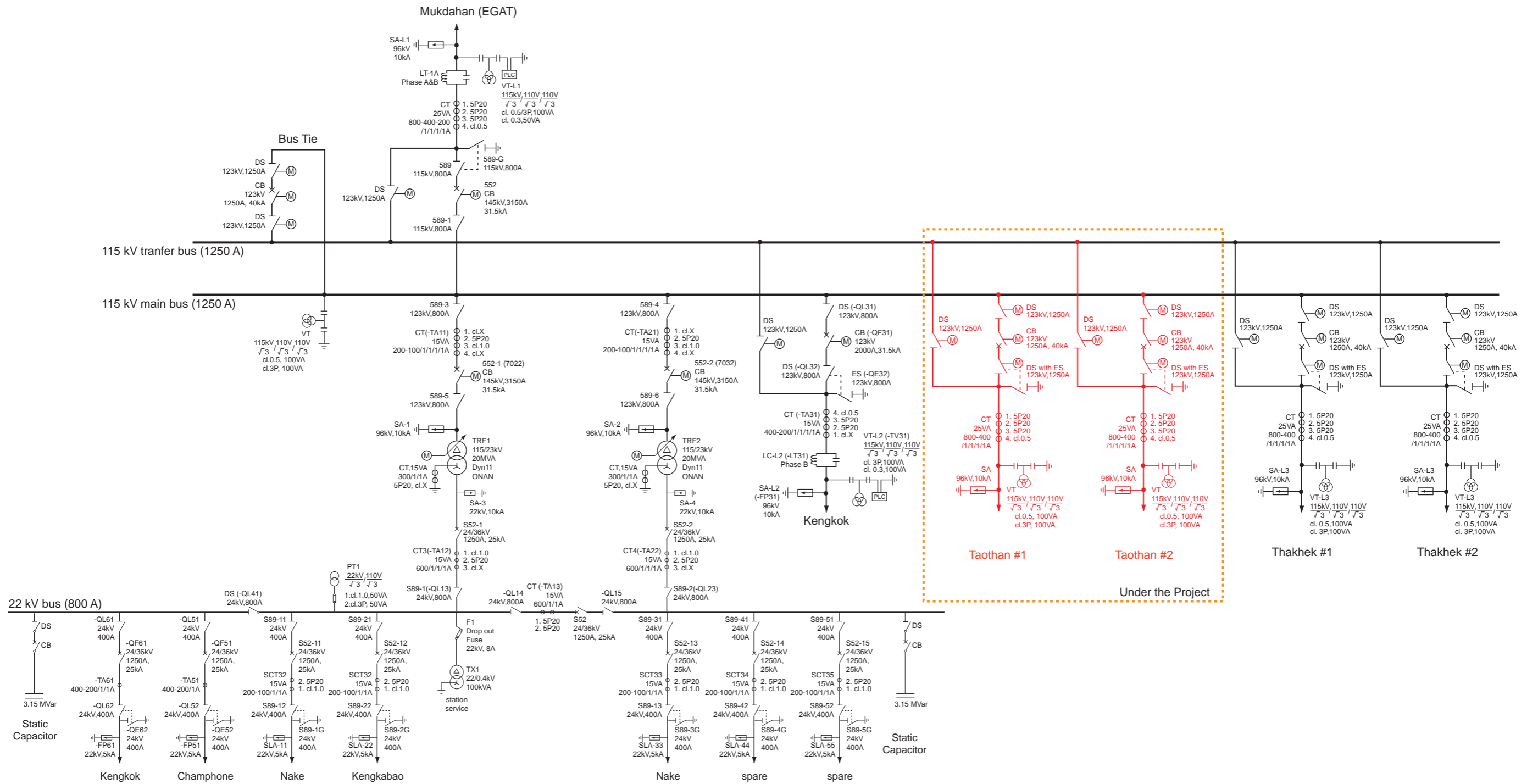


Photo-22: Saravan SS Site

Appendix 13

Substation Drawings for Priority Project

- Drawing No. SS_PKB_01: Pakbo Substation, Single Line Diagram
- Drawing No. SS_PKB_02: Pakbo Substation, Layout
- Drawing No. SS_PKB_03: Pakbo Substation, Section
- Drawing No. SS_TOT_01: Taothan Substation, Single Line Diagram
- Drawing No. SS_TOT_02: Taothan Substation, Layout
- Drawing No. SS_TOT_03: Taothan Substation, Section (1)
- Drawing No. SS_TOT_04: Taothan Substation, Section (2)
- Drawing No. SS_SRV_01: Saravan Substation, Single Line Diagram
- Drawing No. SS_SRV_02: Saravan Substation, Layout
- Drawing No. SS_SRV_03: Saravan Substation, Section



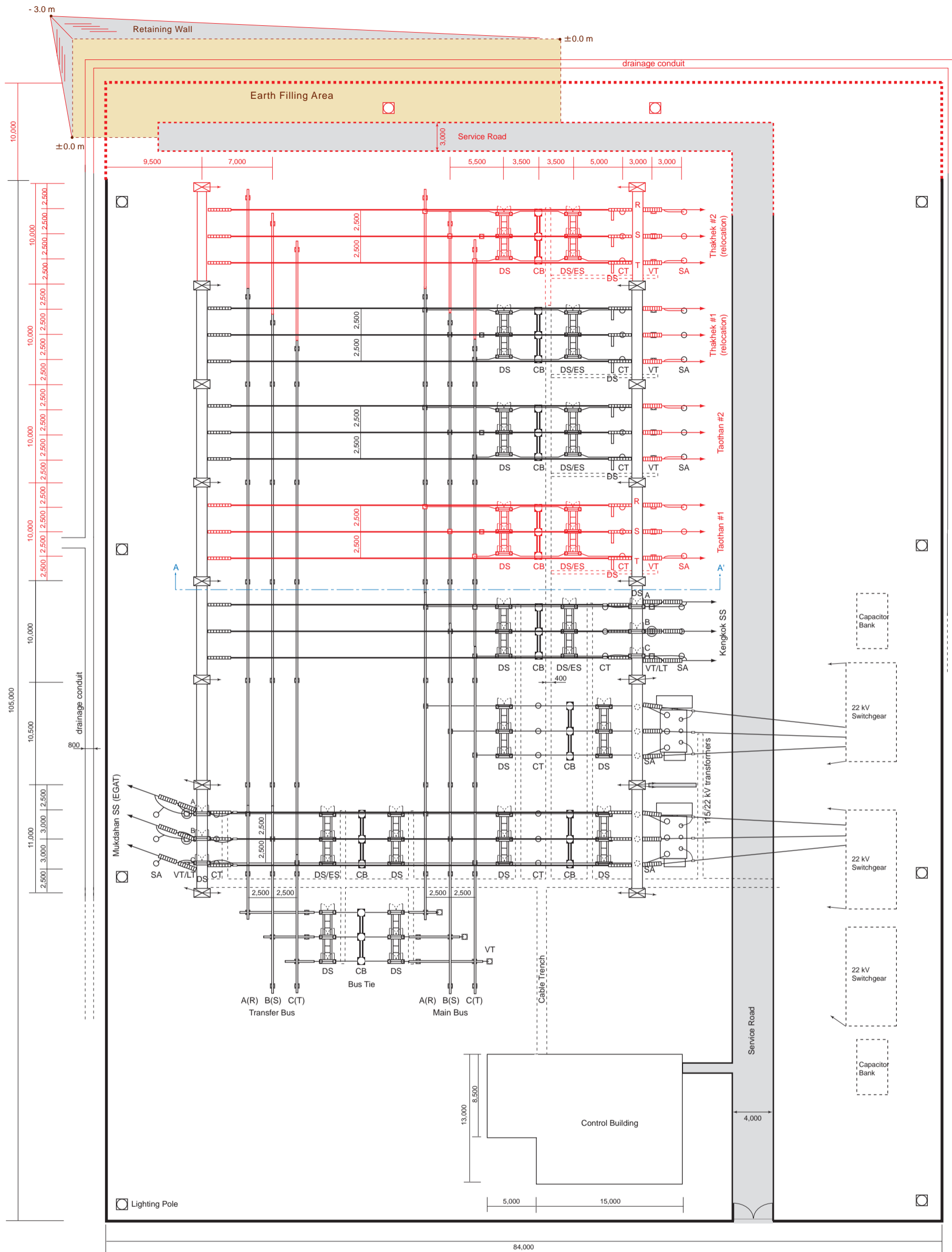
Note:
 Pakbo Substation is under reinforcement by Greater Mekong Power Network Development Project funded by JICA as of October 2009.

REFERENCE ONLY



JICA Japan International Cooperation Agency
 The Study on Power Network System Plan in Lao PDR
 Tokyo Electric Power Company, Inc.
 in association with
 NIPPON KOEI

Drawing No.	SS_PKB_01	Scale	not to scale
Title	Pakbo Substation: Single Line Diagram	Approved by	M. Yogo
		Checked by	J. Fukunaga
		Drew by	J. Fukunaga



- Note**
- CB : Circuit Breakers
 - DS : Disconnectors
 - ES : Eathing Switches
 - CT : Current Transformers
 - LT : Line Traps
 - SA : Sarge Arresters
 - VT : Voltage Transformers
 - SP : Station Post Insulators

REFERENCE ONLY

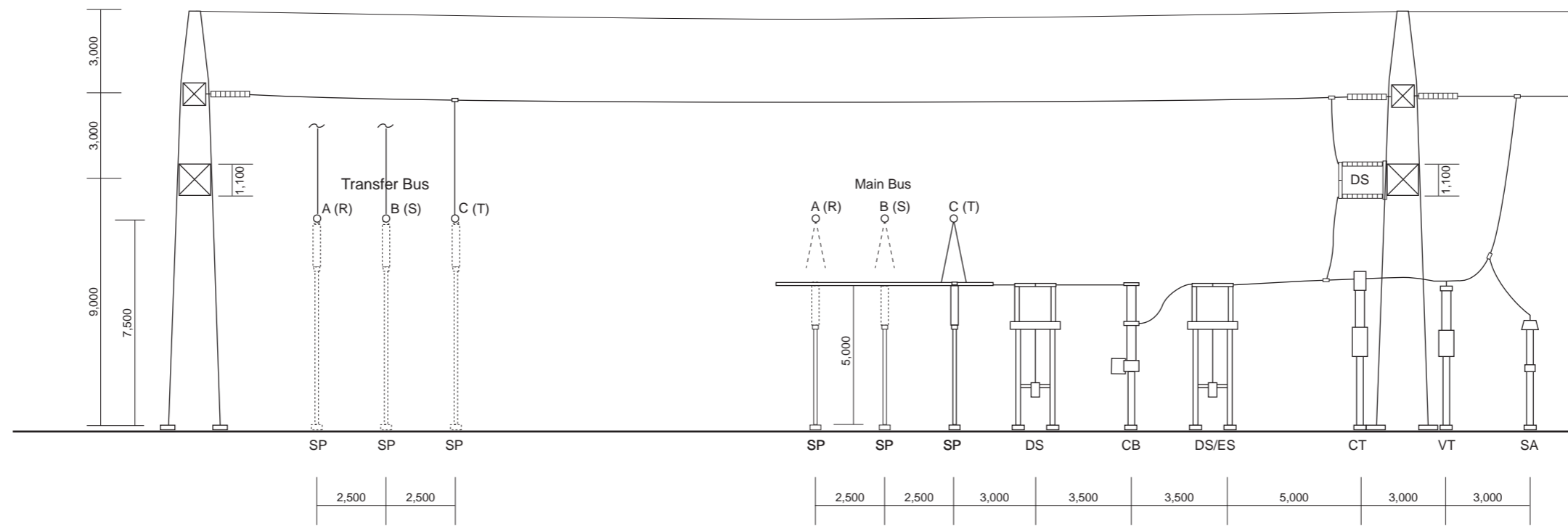
Note:
1. Equipment in red shall be supplied and installed under the Project.



JICA Japan International Cooperation Agency
The Study on Power Network System Plan in Lao PDR
TEPCO Tokyo Electric Power Company, Inc.
 in association with **NIPPON KOEI** Co., Ltd.

Drawing No. SS_PKB_02
Title Pakbo Substation: Layout

Scale	1 : 400
Approved by	M. Yogo
Checked by	J. Fukunaga
Drew by	J. Fukunaga






Section A - A'

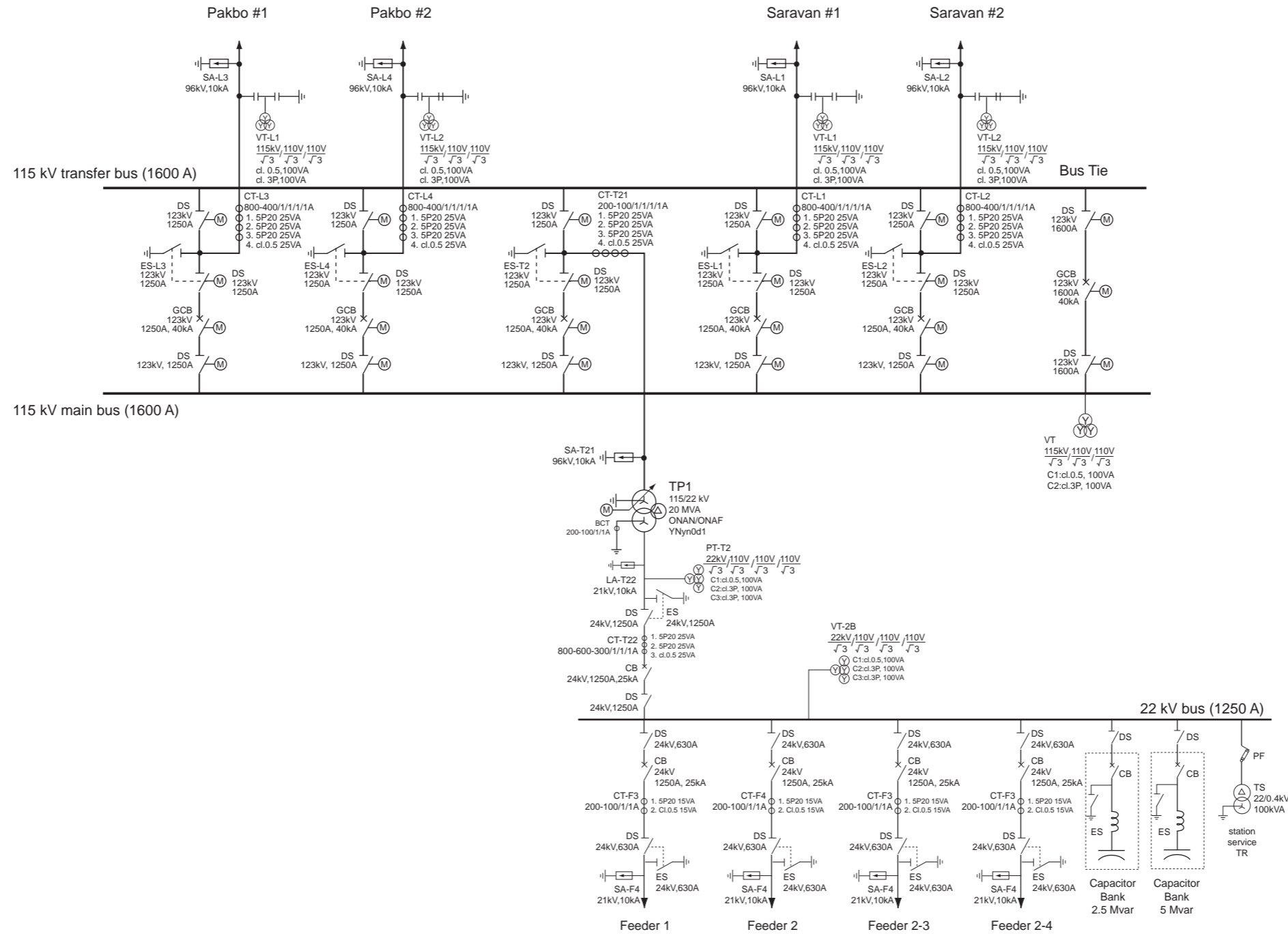
- Note
- CB : Circuit Breakers
 - DS : Disconnectors
 - ES : Eathing Switches
 - CT : Current Transformers
 - LT : Line Traps
 - SA : Sarge Arresters
 - VT: Voltage Tranformers
 - SP: Station Post Insulators

REFERENCE ONLY



 Japan International Cooperation Agency
 The Study on Power Network System Plan in Lao PDR
 Tokyo Electric Power Company, Inc.
 in association with  NIPPON KOEI Co., Ltd.

Drawing No.	SS_PKB_03	Scale	1 : 200
Title	Pakbo Substation: Section	Approved by	M. Yogo
		Checked by	J. Fukunaga
		Drew by	J. Fukunaga

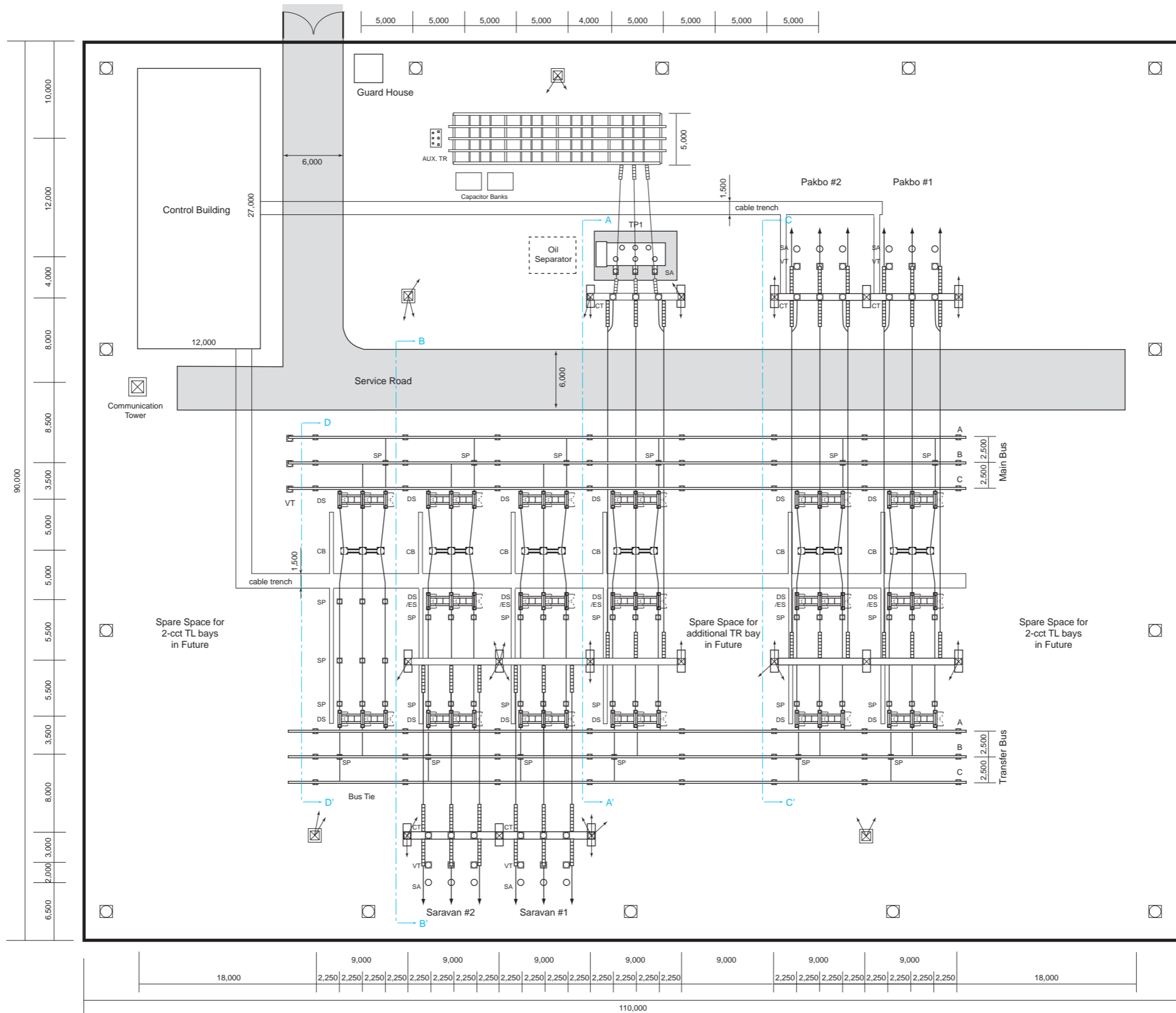


REFERENCE ONLY



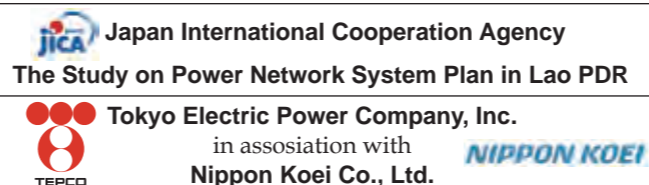
JICA Japan International Cooperation Agency
The Study on Power Network System Plan in Lao PDR
TEPCO Tokyo Electric Power Company, Inc.
 in association with **NIPPON KOEI** Nippon Koei Co., Ltd.

Drawing No.	SS_TOT_01	Scale	not to scale
Title	Taothan Substation: Single Line Diagram	Approved by	M. Yogo
		Checked by	J. Fukunaga
		Drew by	J. Fukunaga

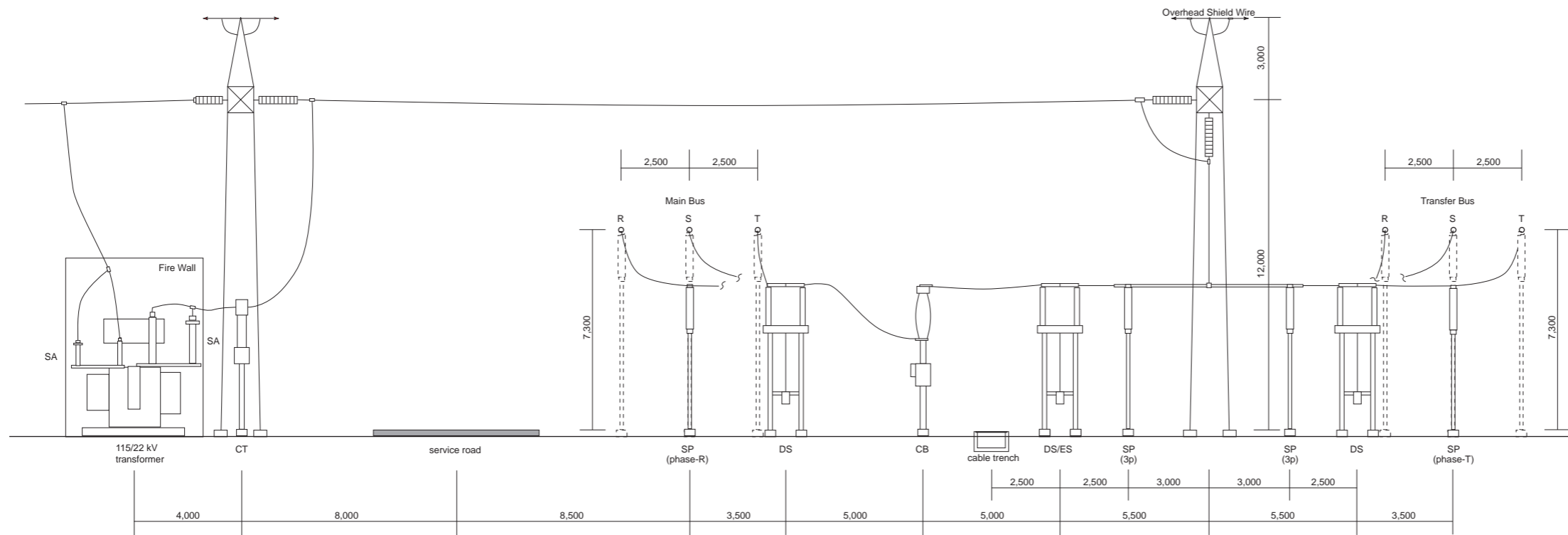


- Note**
- CB : Circuit Breakers
 - DS : Disconnecting Switches
 - ES : Eathing Switches
 - CT : Current Transformers
 - SA : Sarge Arresters
 - VT: Voltage Transformers
 - SP: Station Post Insulators

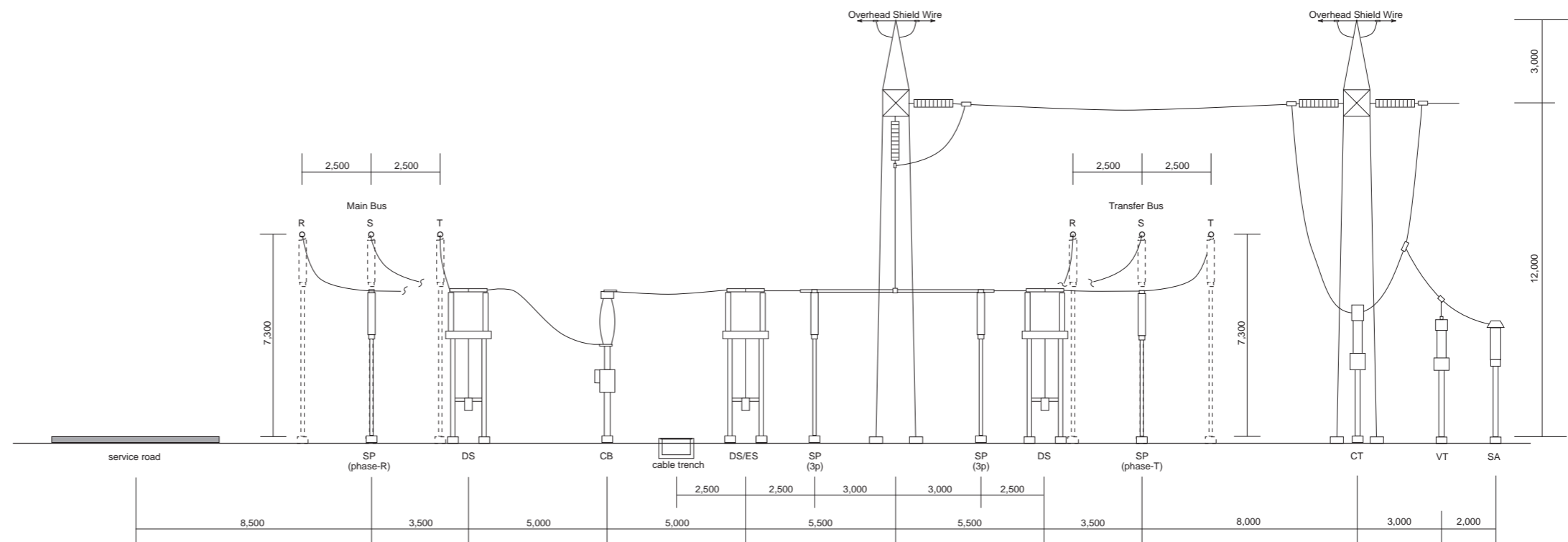
REFERENCE ONLY



Drawing No. SS_TOT_02	Scale	1 : 450
Title Taothan Substation: Layout	Approved by	M. Yogo
	Checked by	J. Fukunaga
	Drew by	J. Fukunaga



Section A - A'

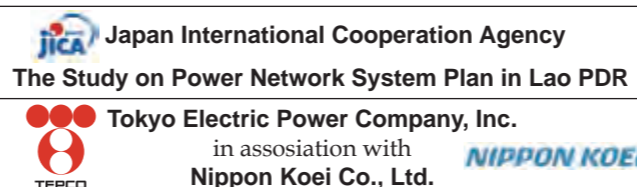


Section B - B'

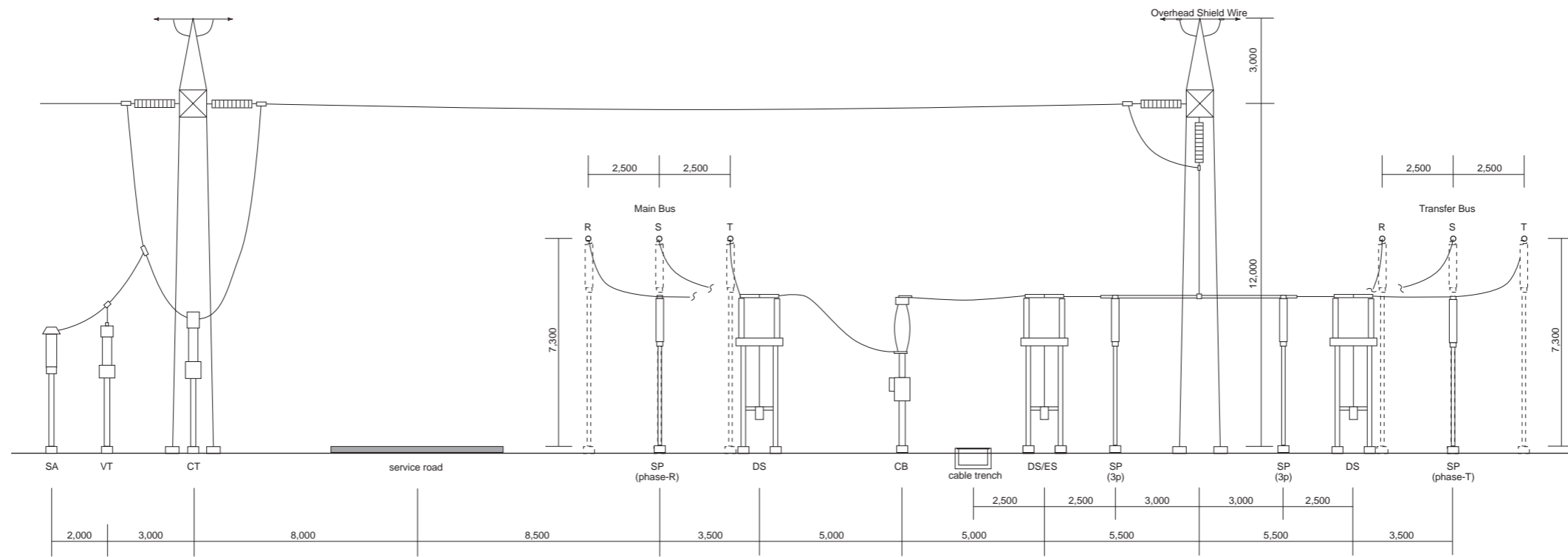
Note

- CB : Circuit Breakers
- DS : Disconnecting Switches
- ES : Eathing Switches
- CT : Current Transformers
- SA : Sarge Arresters
- VT: Voltage Tranformers
- SP: Station Post Insulators

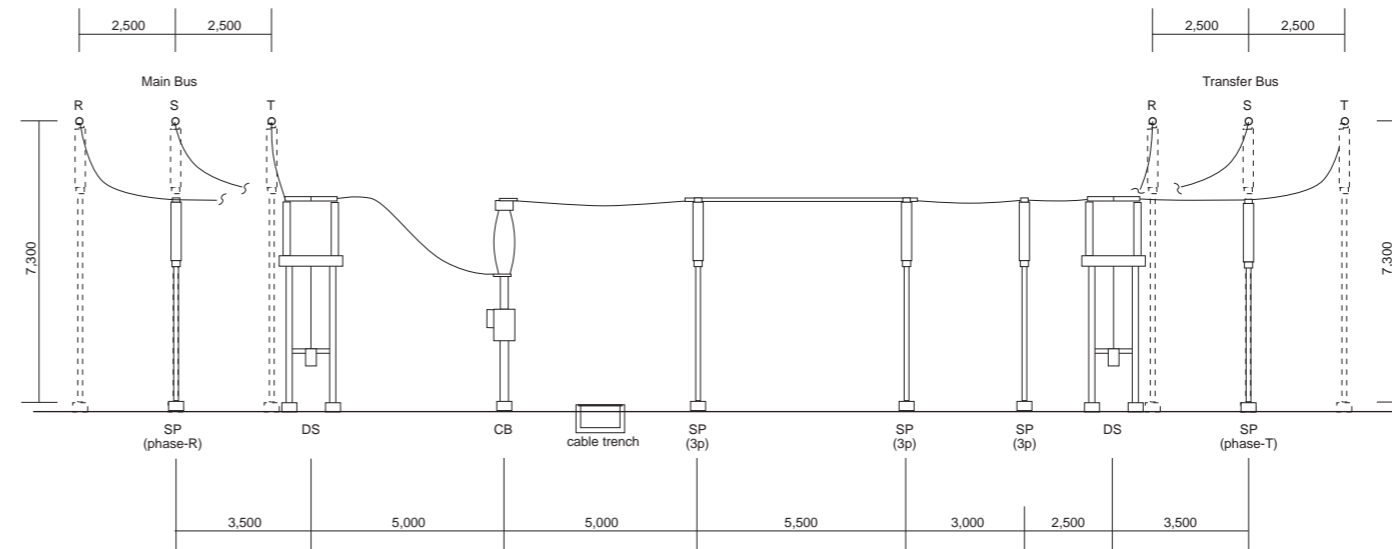
REFERENCE ONLY



Drawing No.	SS_TOT_03	Scale	1 : 200
Title	Taothan Substation: Section 01	Approved by	M. Yogo
		Checked by	J. Fukunaga
		Drew by	J. Fukunaga



Section C - C'

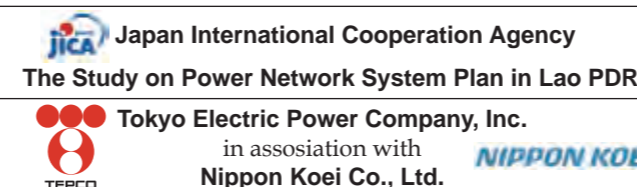


Section D - D'

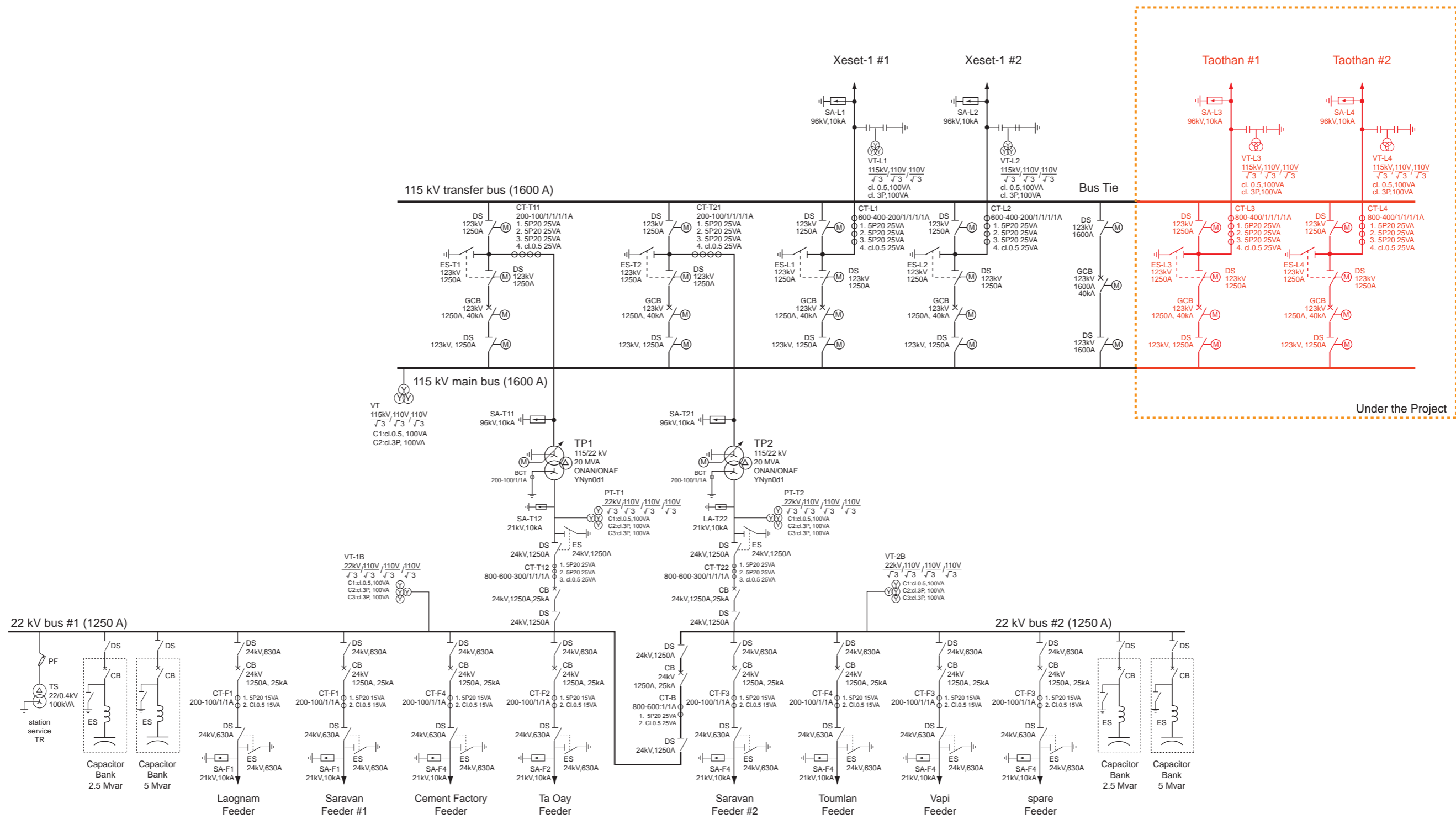
Note

- CB : Circuit Breakers
- DS : Disconnecting Switches
- ES : Eathing Switches
- CT : Current Transformers
- SA : Sarge Arresters
- VT: Voltage Tranformers
- SP: Station Post Insulators

REFERENCE ONLY



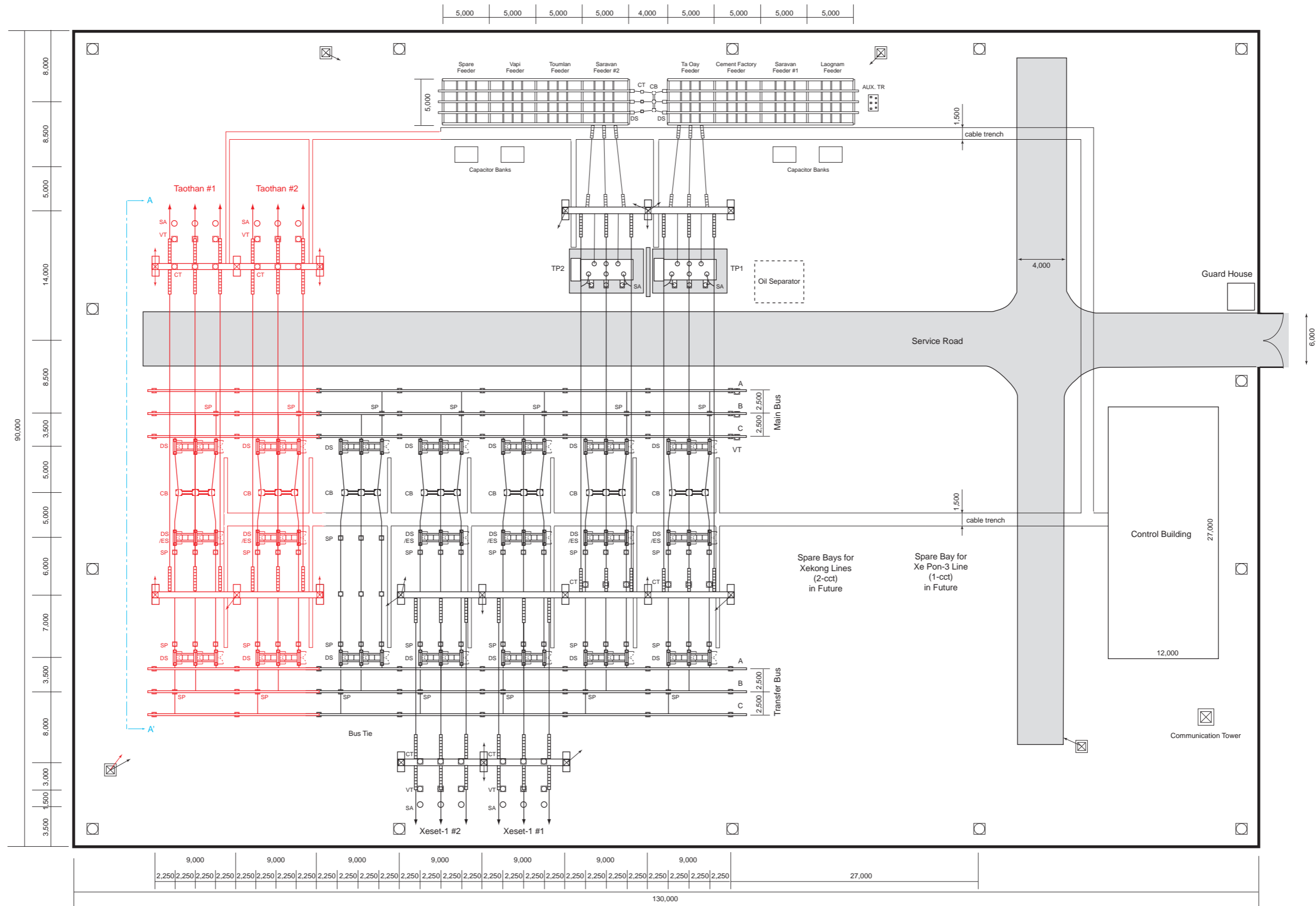
Drawing No.	SS_NSN_04	Scale	1 : 200
Title	Taothan Substation: Section 02	Approved by	M. Yogo
		Checked by	J. Fukunaga
		Drew by	J. Fukunaga



Note:
Saravan Substation is under construction by GMS Power Trade Project funded by IDA as of October 2009.

REFERENCE ONLY




	Japan International Cooperation Agency The Study on Power Network System Plan in Lao PDR	Drawing No. SS_SRV_01	Scale	not to scale
	Tokyo Electric Power Company, Inc. in association with NIPPON KOEI, Ltd.	Title Saravan Substation: Single Line Diagram	Approved by	M. Yogo
			Checked by	J. Fukunaga
			Drew by	J. Fukunaga



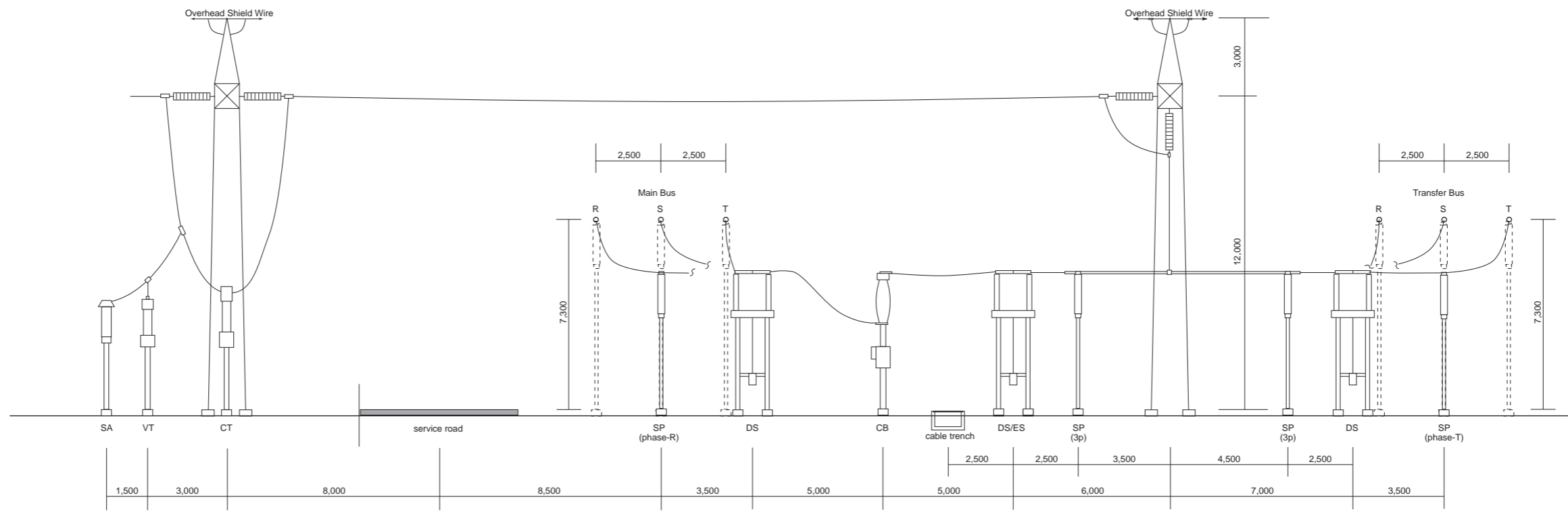
- Note**
- CB : Circuit Breakers
 - DS : Disconnecting Switches
 - ES : Eathing Switches
 - CT : Current Transformers
 - SA : Sarge Arresters
 - VT: Voltage Transformers
 - SP: Station Post Insulators

REFERENCE ONLY



 **Japan International Cooperation Agency**
The Study on Power Network System Plan in Lao PDR
 **Tokyo Electric Power Company, Inc.**
 in association with
 **NIPPON KOEI, Ltd.**





Drawing No.	SS_SRV_02	Scale	1 : 450
Title	Saravan Substation: Layout	Approved by	M. Yogo
		Checked by	J. Fukunaga
		Drew by	J. Fukunaga



Section A - A'

- Note
- CB : Circuit Breakers
 - DS : Disconnecting Switches
 - ES : Earthing Switches
 - CT : Current Transformers
 - SA : Sarge Arresters
 - VT : Voltage Transformers
 - SP : Station Post Insulators

REFERENCE ONLY

 <p>Electricite du Laos</p>	 <p>Japan International Cooperation Agency</p> <p>The Study on Power Network System Plan in Lao PDR</p>	 <p>Tokyo Electric Power Company, Inc.</p> <p>in association with</p>  <p>NIPPON KOEI Co., Ltd.</p>	Drawing No. SS_SRV_03	Scale	1 : 200
			<p>Title</p> <p>Saravan Substation: Section</p>		Approved by
			Checked by	J. Fukunaga	
			Drew by	J. Fukunaga	