

CHAPTER 3

THE EXISTING DATA OF STUDY

This thesis consider two cases which are five buses sample system and twenty one buses system in central I of Electricite Du Lao (EDL) in Lao PDR system [3]-[4].

3.1 Data of Five-bus Sample System

The five-bus sample system shown in Figure 1.1. There are 2 generator buses, 3 load buses for five-bus sample system. This system is assembled using 3-day daily load curve and performing load flow analysis for 72 hour of load demand. The active load, reactive load, and voltage profile are shown in the Figure.3.1, Figure 3.2 and Figure 3.3, respectively.

It is notably that there are two peaks in the daily demand patterns. The first peak demand is in the daytime during 9:00 to 16:00. It is mostly for commercial and industrial sectors, as well as government offices in the greater metropolitan area whereas the second peak in the night time between 19:00 to 22:00 o'clock is for residential load.

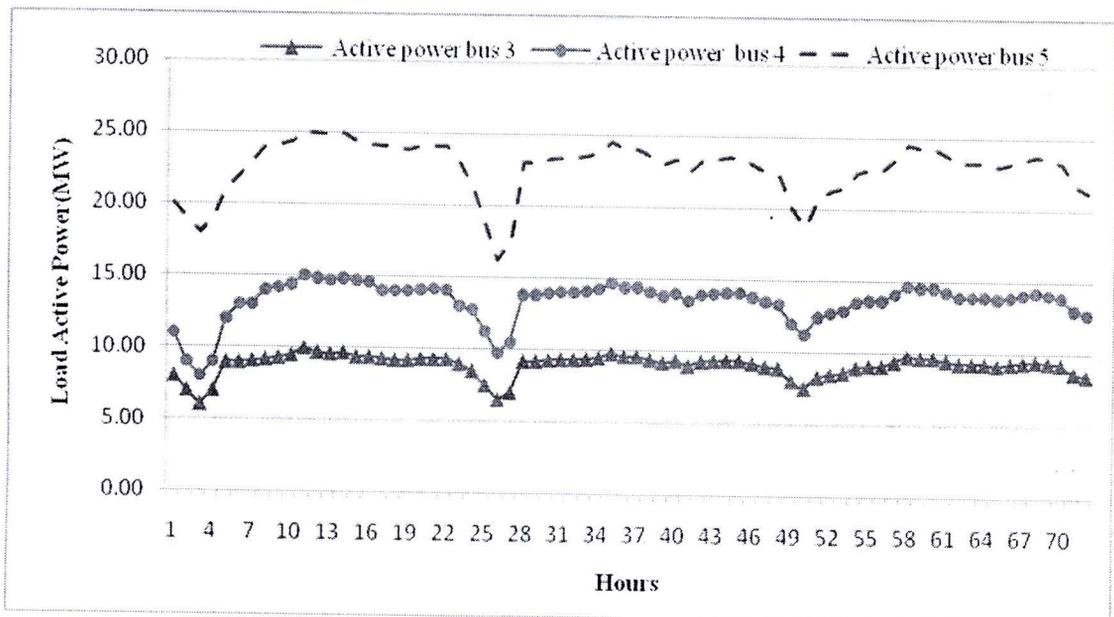


Figure 3.1 3-day daily active load curves for 3 load buses of five-bus sample system

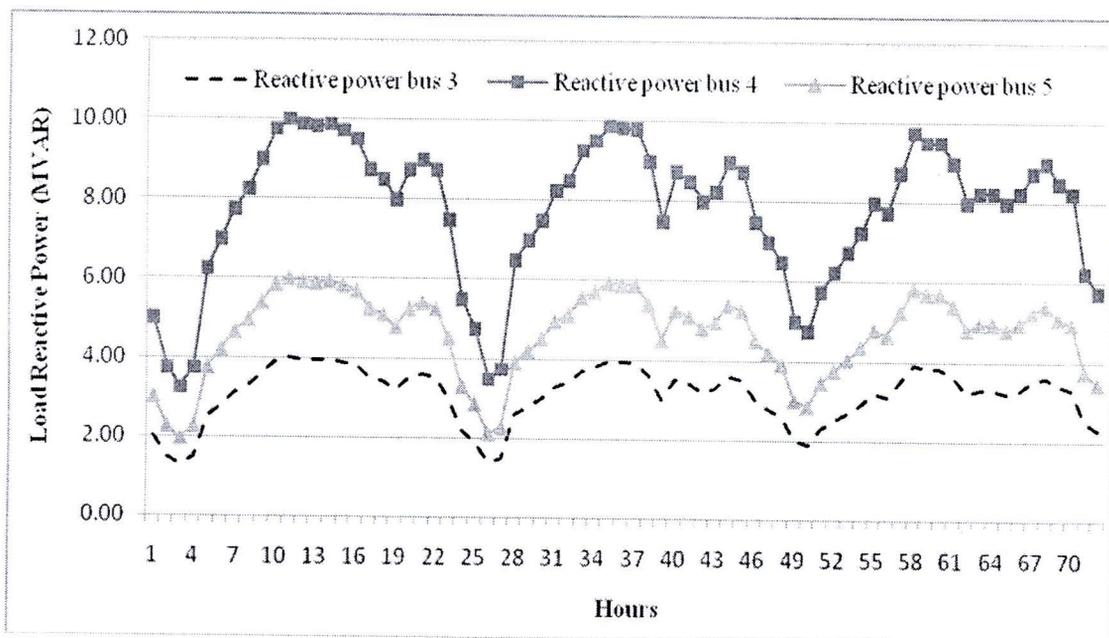


Figure 3.2 3-day daily reactive load curves for 3 load buses of five-bus sample system

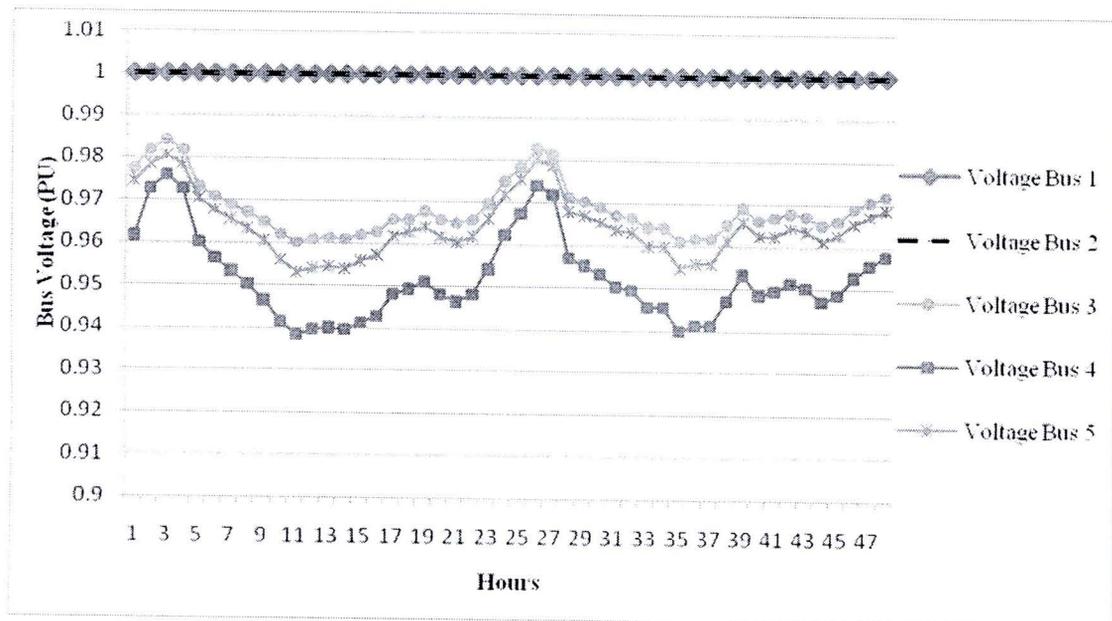


Figure 3.3 3-day daily voltage curves of five-bus sample system

The data is calculated by Y-bus matrix method for five-bus sample system which is shown in Fig.1. The result of the allocating reactive power of transferring between generators and load which is shown Table 3.1.

Table 3.1 Allocating reactive power by the Y-bus matrix method for five-bus system

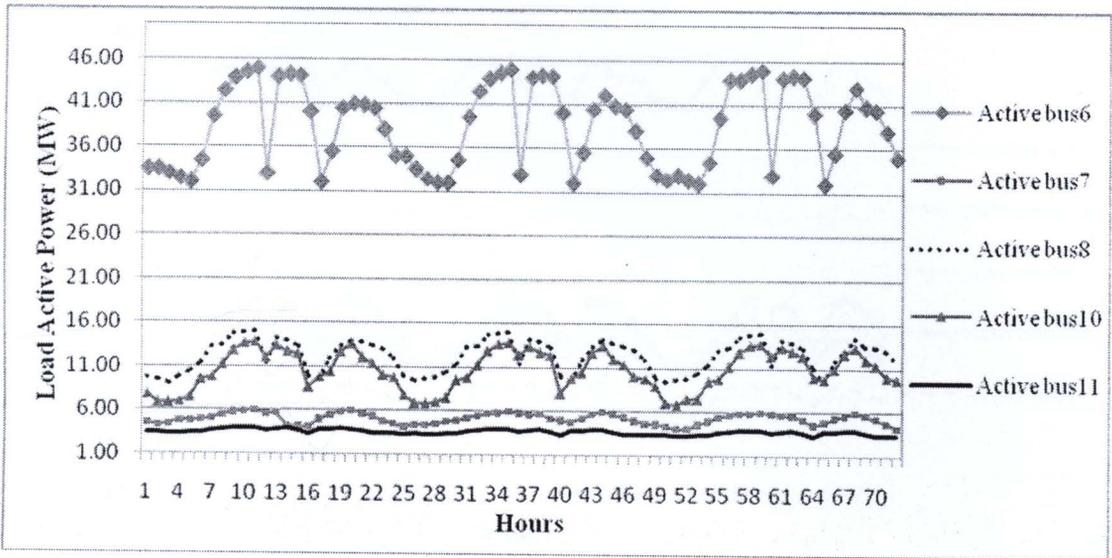
Bus No.	Reactive Power Load (MVAR)	Gen.1 (MVAR)	Gen.2 (MVAR)
3	2.00	1.44	0.56
4	5.00	1.47	3.53
5	3.00	0.50	2.50

For the detail of five-bus sample system which is bus data, line data, active power, reactive power and voltage profile which are show in appendix A

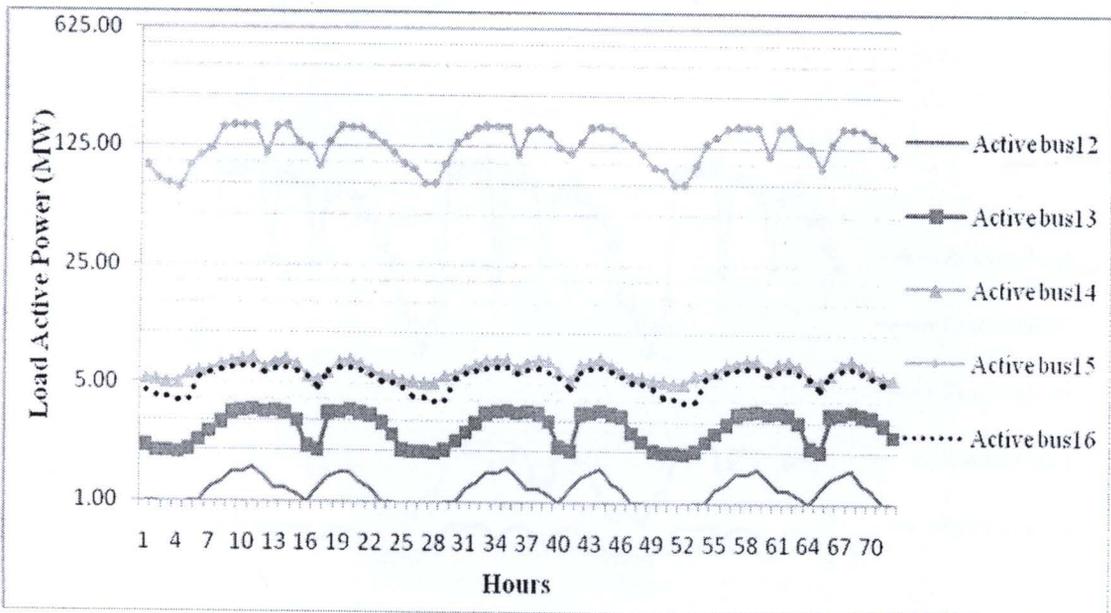
3.2 Data System of 21-bus System in Central I of Electricite Du Lao (EDL) in Lao PDR

The 21-bus system in central I of Electricite Du Lao (EDL) in Lao PDR system or EDL 21-bus system shown in Figure1.2. There are 4 generator buses, 15 load buses and 2 transfer buses for EDL 21-bus system, this system is assembled using 3-day daily load curve and performing load flow analysis for 72 hour of load demand. The active load, reactive load, and voltage profile are shown in the Figure.3.4, Figure 3.5 and Figure 3.6, respectively.

It is notably that there are two peaks in the daily demand patterns for Lao PDR. The first peak demand is in the daytime during 9:00 to 16:00. It is mostly for commercial and industrial sectors, as well as government offices in the greater metropolitan area whereas the second peak in the night time between 19:00 to 22:00 o'clock is for residential load.

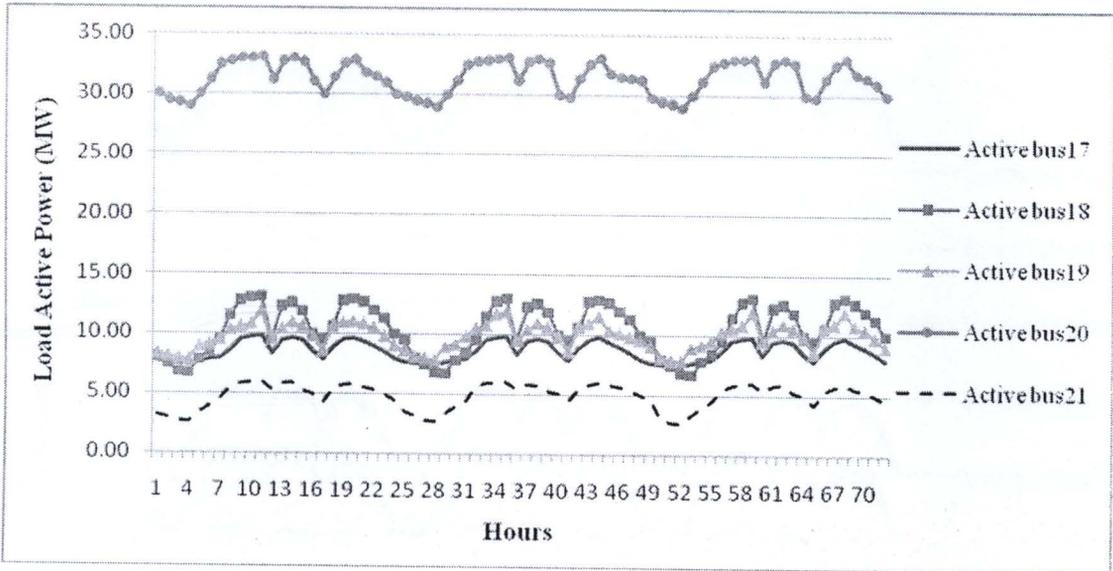


(a) Active bus 6-11

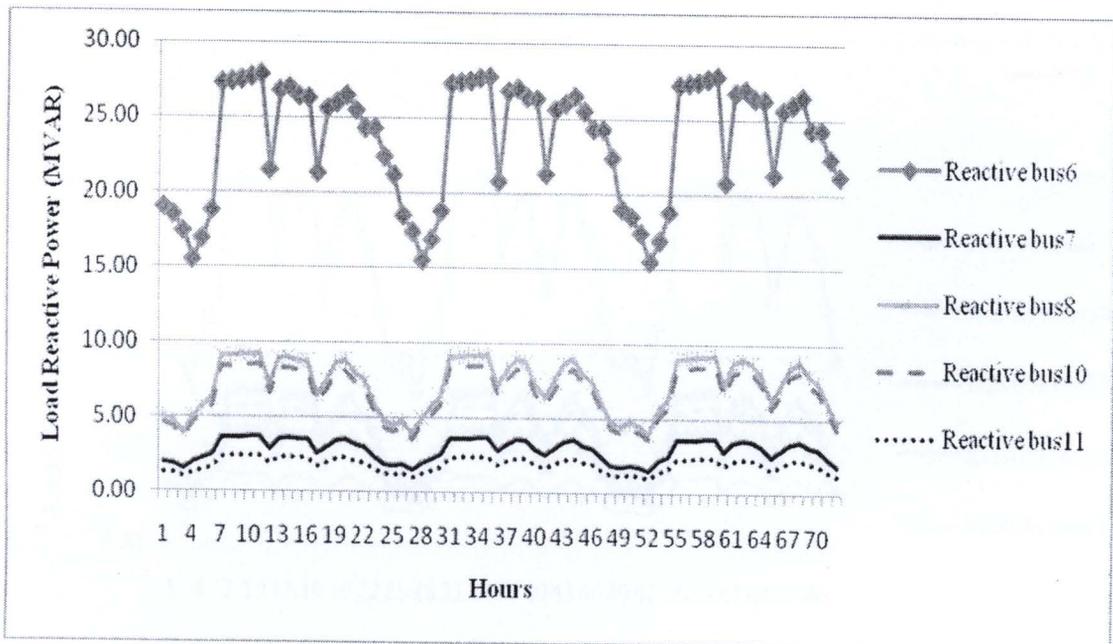


(b) Active bus 12-16

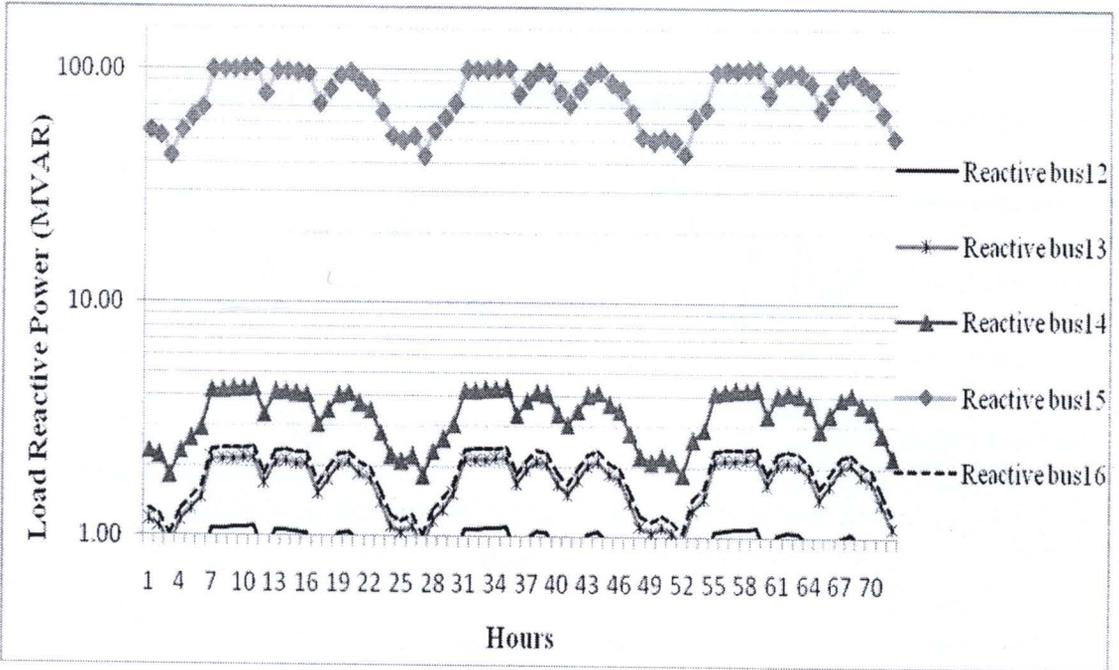




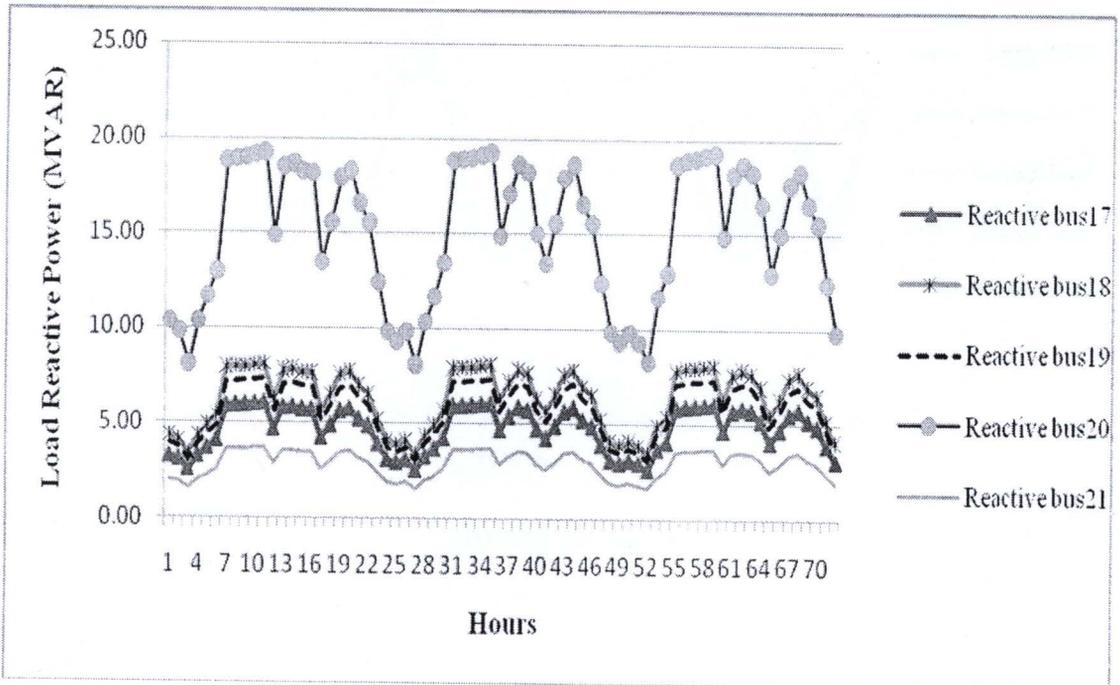
(c) Active bus 17-21

Figure 3.4 3-day daily active load curves for 15 load buses of EDL 21-bus system

(a) Reactive bus 6-11

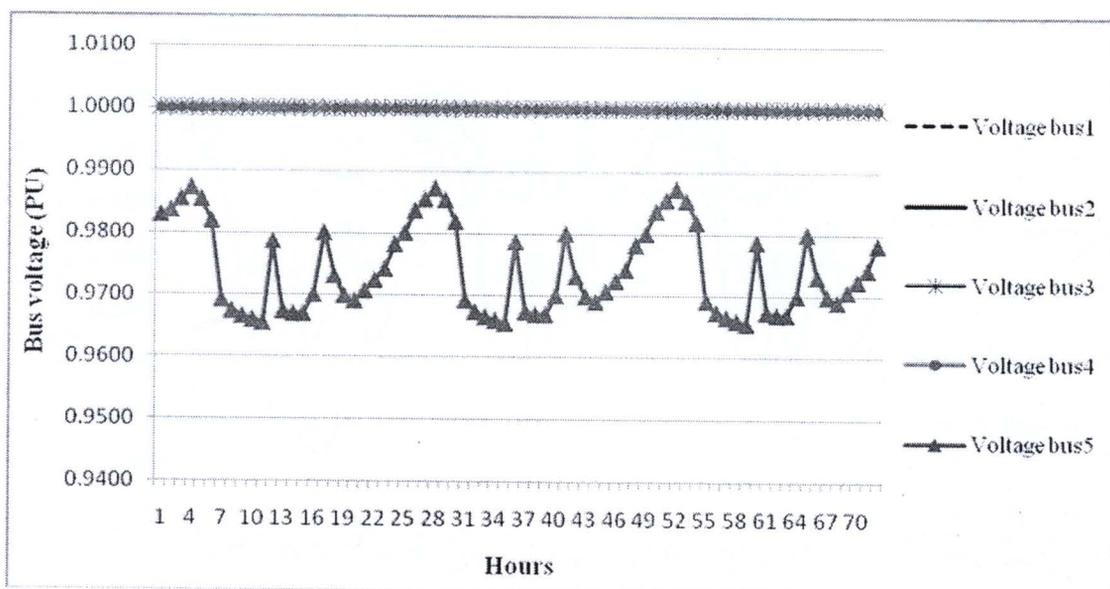


(b) Reactive bus 12-16

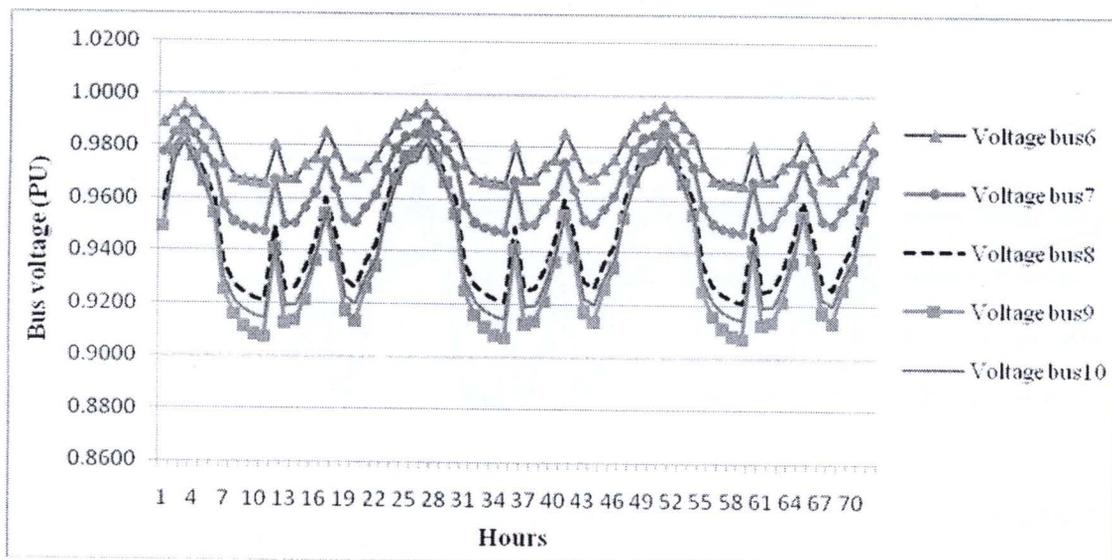


(c) Reactive bus 17-21

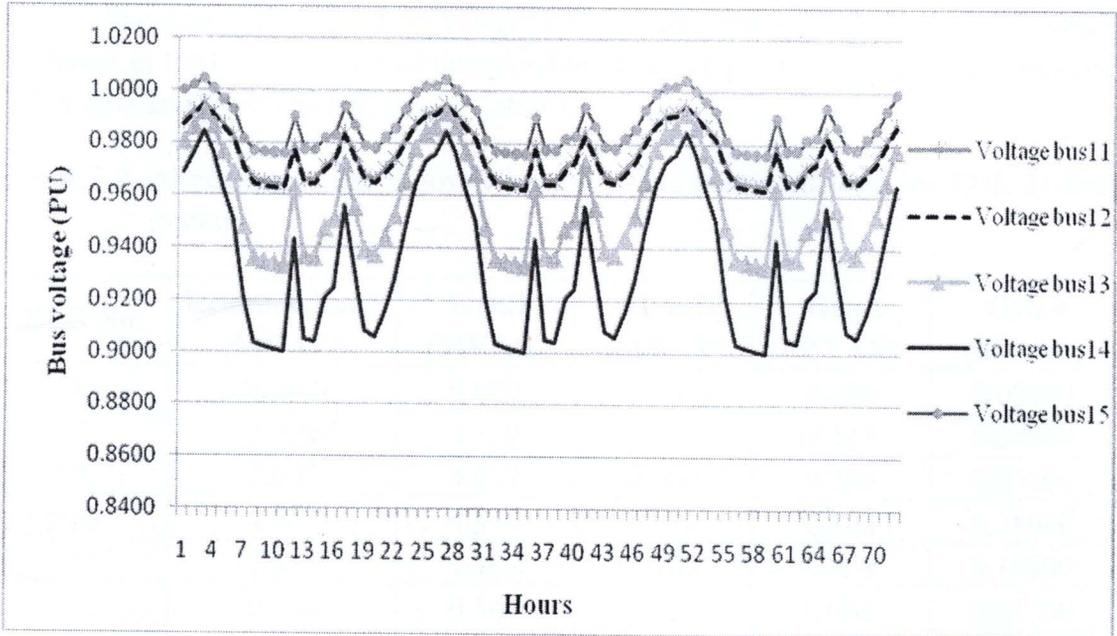
Figure 3.5 3-day daily reactive load curves for 15 load buses of EDL 21-bus system



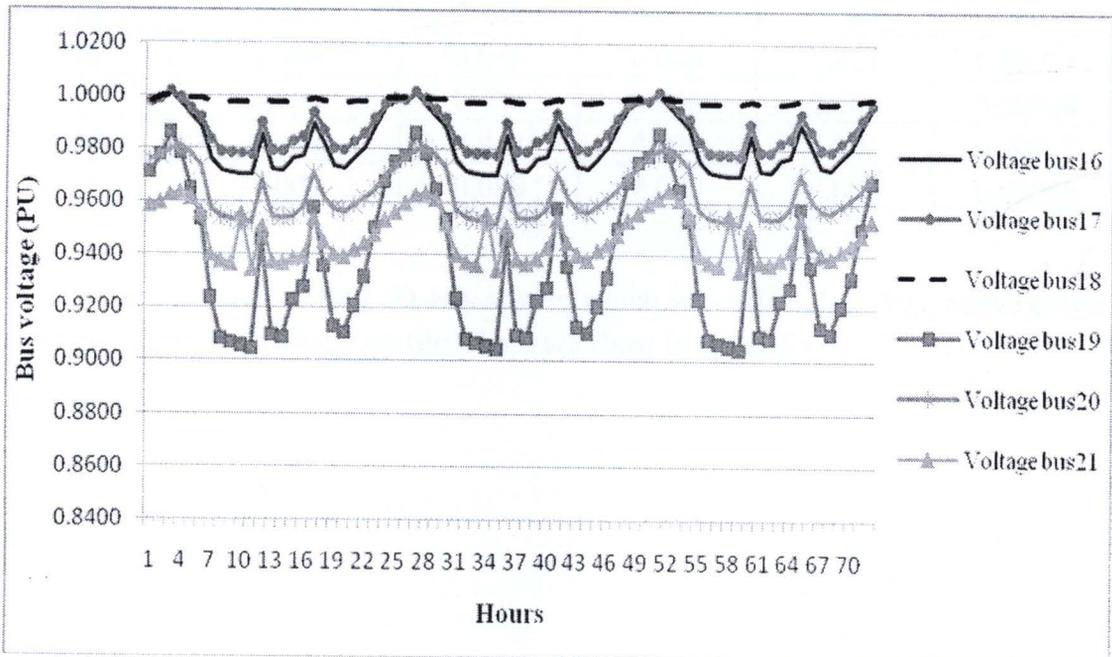
(a) Bus voltage 1-5



(b) Bus voltage 6-10



(c) Bus voltage 11-15



(d) Bus voltage 16-21

Figure 3.6 3-day daily voltage curves of EDL 21-bus system

The data is calculated by Y-bus matrix method for EDL 21-bus system which is shown in Fig1.2. The result of the allocating reactive power of transferring between generators and load which is shown Table 3.2.

Table 3.2 Allocating reactive power by the Y-bus matrix method for EDL 21-bus system

BUS No.	Reactive Load (MVAR)	Gen.1 (MVAR)	Gen.2 (MVAR)	Gen.3 (MVAR)	Gen.4 (MVAR)
6	19.000	0.000	19.000	0.000	0.00000
7	2.000	1.838	0.000	0.113	0.04900
8	5.000	4.677	0.000	0.269	0.05400
10	4.597	4.154	0.000	0.166	0.28000
11	1.333	1.169	0.000	0.054	0.10700
12	0.591	0.547	0.000	0.032	0.01100
13	1.167	1.079	0.000	0.064	0.02700
14	2.333	2.033	0.000	0.270	0.02700
15	54.978	49.859	0.000	5.120	0.00060
16	1.301	1.080	0.000	0.215	0.00050
17	3.263	2.740	0.000	0.520	0.00032
18	4.366	0.943	0.000	3.427	0.00021
19	3.962	0.000	3.960	0.000	0.00000
20	10.360	4.458	0.000	5.902	0.00027
21	2.000	0.000	2.000	0.000	0.00000

For the detail of EDL 21-bus system which is bus data, line data, active power, reactive power and voltage profile which are show in appendix B.