

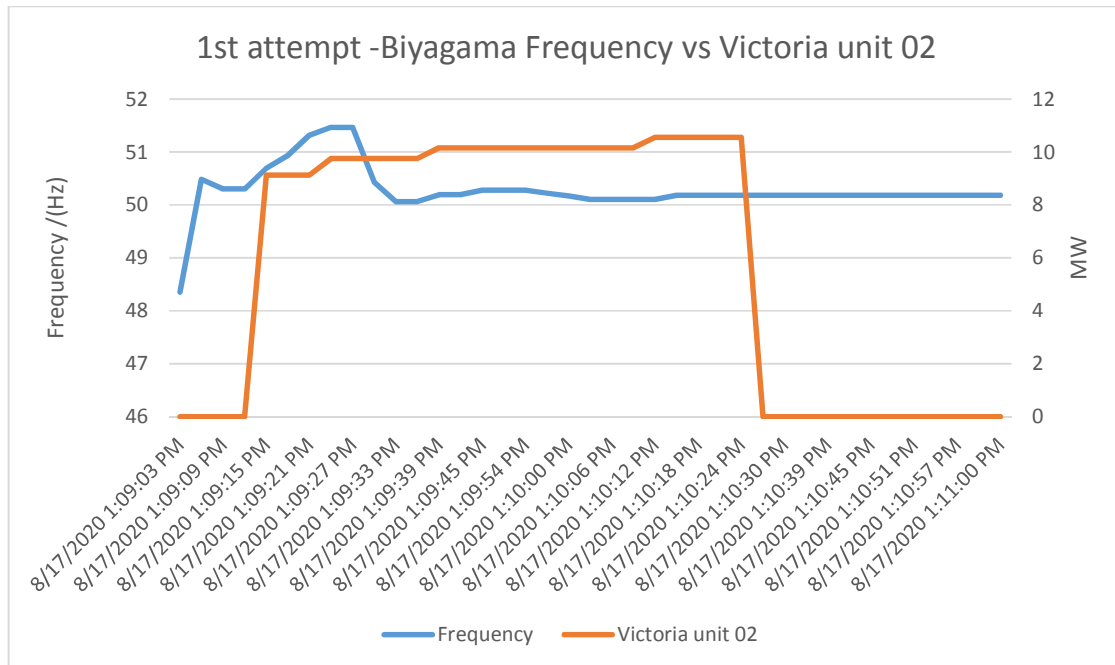
System Restoration

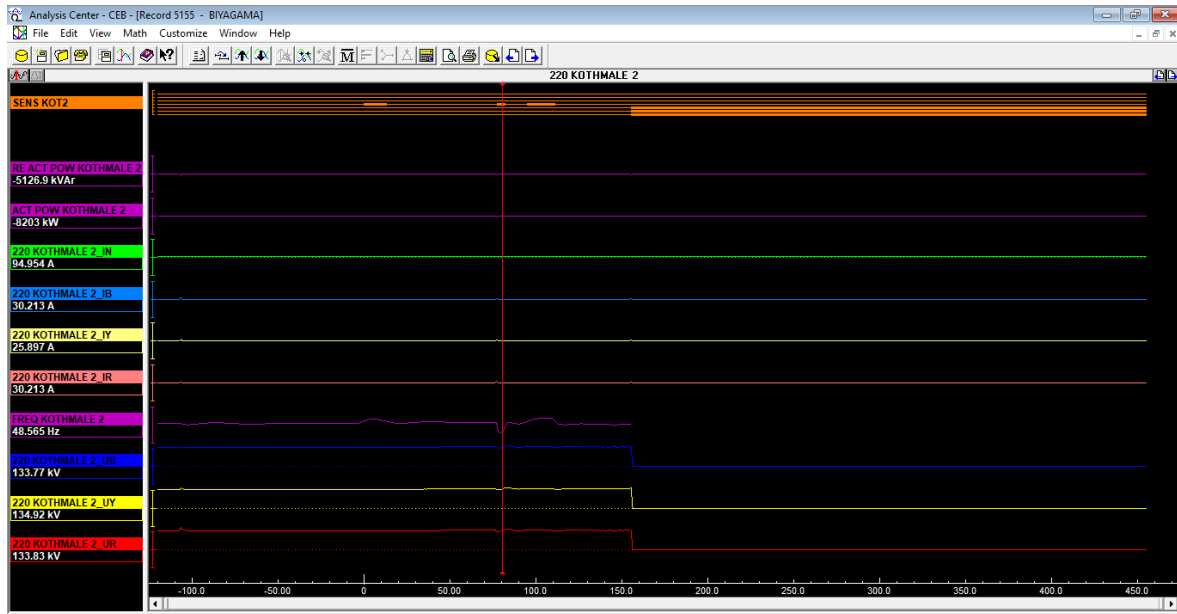
System Restoration comments at 12:57 hrs from Victoria generator 02 as it was spinning full speed no load at that time. After six consecutive failed attempts seven attempt was succeeded which was started at 16.12 hrs. Detailed analysis of failed attempts are described below. At the same time, restoration started from Laxapana complex as well. It was again failed in six consecutive attempts. However, Samanalawewa generator 01 started 13.29 hrs and energized southern system successfully after few attempts. In addition to that Kukule generators operated island mode successfully by feeding to Mathugama and Ambalangoda GSS.

Restoration from Mahaweli Complex

1st Attempt: From Victoria Generator 02

No	Location	Equipment	Time
1	Victoria	Gen 02 Resumed	12:55:26
2	Victoria	Kothmale PS 01	12:55:26
3	Kothmale	PS supply received	12:59:05
4	Kothmale	Biya 02 energized	13:01:28
5	Biyagama	GSS supply received	13:05:48
6	Biyagama	33kV F2 energized	13:08:50
7	Biyagama	Sapugaskanda 01 energized	13:10:10
8	Sapugaskanda	Biyagama 01 energized	13:10:11
9	Victoria	Gen 02 / tripped	13:10:11
10		10 MW & 16MVar lagging at the time of tripping	
11		Tripped due to excitation stage II	





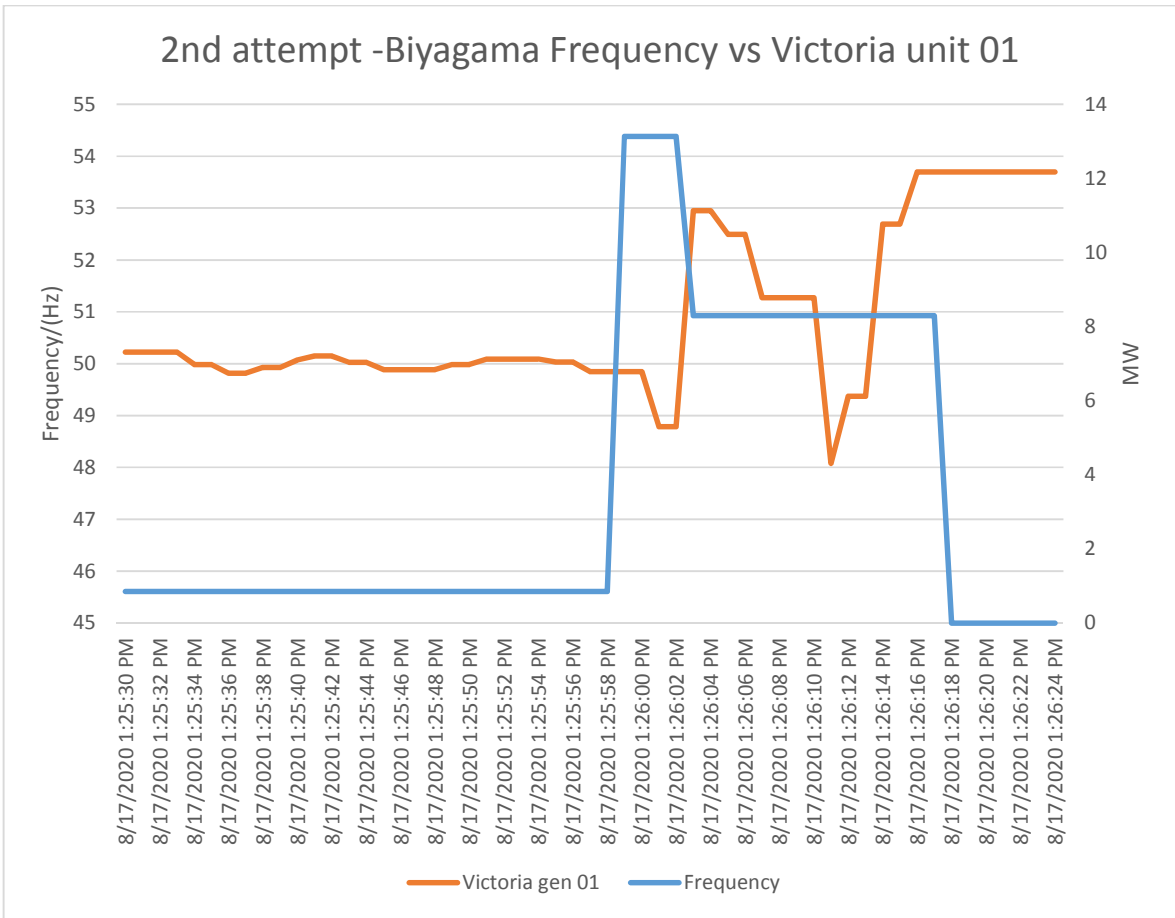
Biyagama Ben Record

System Control Comments:

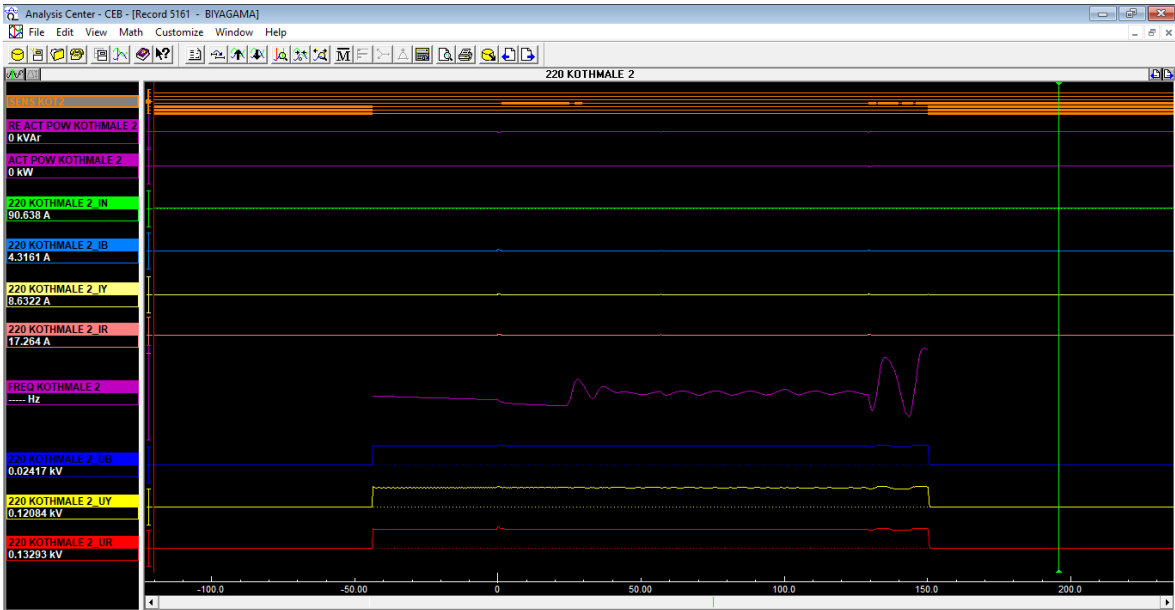
System frequency was stable at the time of the tripping and Victoria generator tripped with the energizing the Biyagama 132kV line 01 from Sapugaskanda GSS. Governor was at Auto ep2 (7.5%)

2nd Attempt: From Victoria Generator 01

No	Location	Equipment	Time
1	Victoria	Gen 01 Resumed	13:20:47
2	Kothmale	Kothmale PS 01 supply received via 21152 and 22152CBs at Victoria	13:20:47
4	Kothmale	Biyagama 02 energized	13:23:10
5	Biyagama	GSS supply received	13:23:49
6	Biyagama	33kV F3 energized	13:24:44
7	Biyagama	33kV F4 energized	13:25:37
8	Victoria	Gen 01 / tripped	13:26:19
9		Frequency hunt observed	
10		8 MW & 17 MVar lagging at the time of tripping	
11		Tripped with indication of over frequency	



Biyagama BEN



System Control Comments:

System frequency oscillation observed for few seconds while and before the generator tripping and no any triggering point identified for frequency oscillation. Governor was at Auto ep2 (7.5%)

3rd Attempt: From Victoria Generator 01

No	Location	Equipment	Time
1	Victoria	Gen 01 Resumed	13:30:32
3	Kothmale	Kothmale PS 01 supply received via 21152 and 22152CBs at Victoria	Remain Closed
4	Kothmale	Victoria 01 energized	13:33:47
5	Kothmale	Biyagama 02 remain energized	
6	Biyagama	Kotmale 02 energized	13:34:55
7	Biyagama	Sapugaskanda 01 energized	13:35:45
8	Victoria	Gen 01 / tripped	13:35:46
9		Tripped due to excitation stage II	
10		0 MW & 0 MVar lagging at the time of tripping	

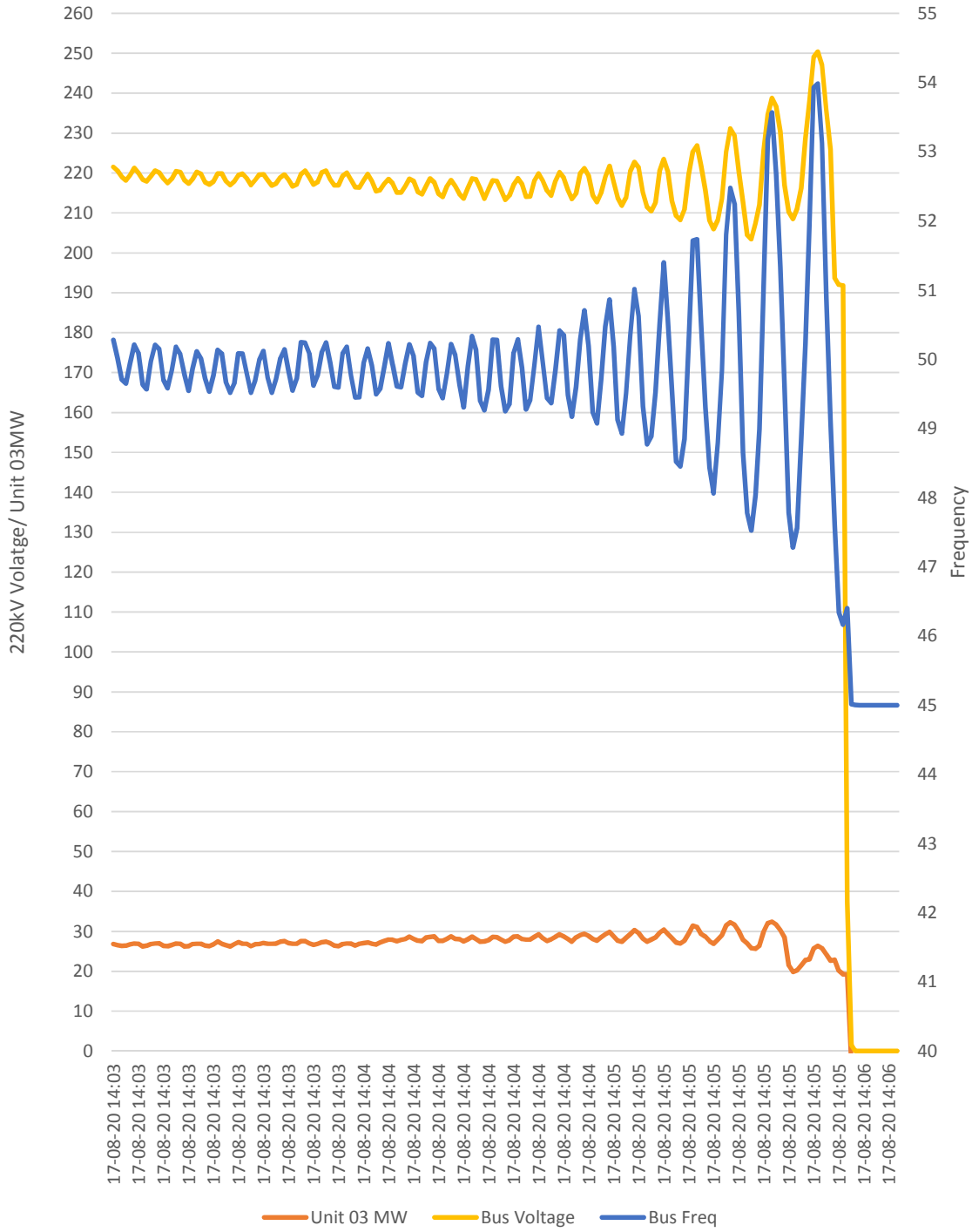
System Control Comments:

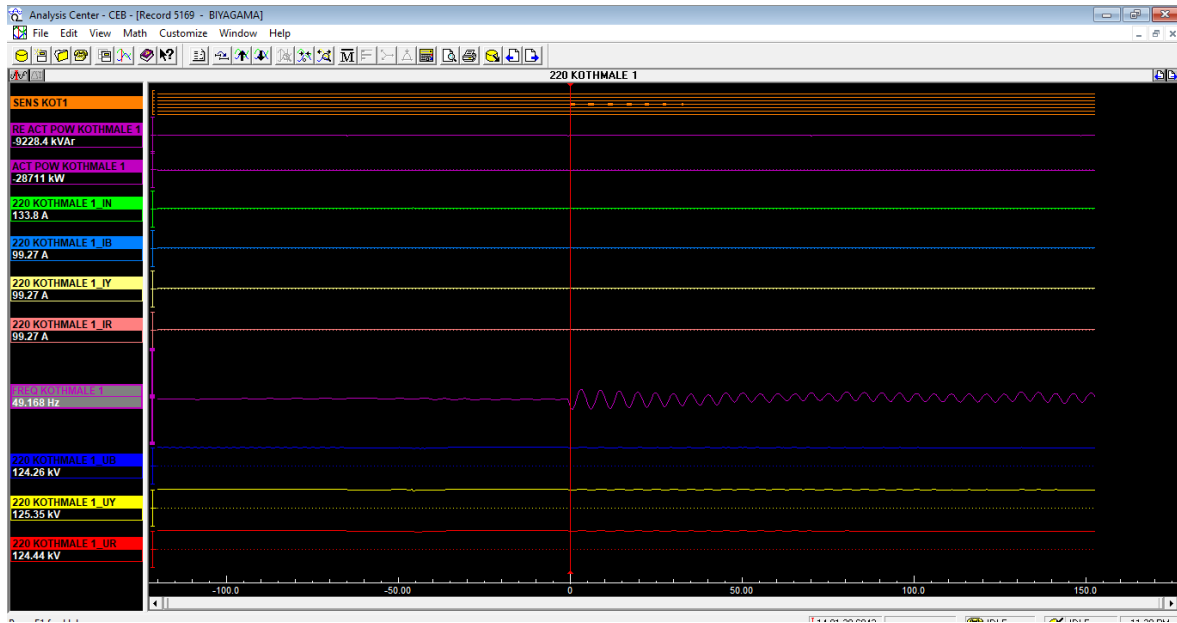
Victoria generator tripped with the energizing the Sapugaskanda 132kV line 01 from Biyagama GSS. Sapugaskanda- Biyagama line 01 remain energized from Sapugaskanda GSS. Governor was at Auto ep2 (7.5%)

4th Attempt: From Kotmale Generator 03

No	Location	Equipment	Time
1	Kothmale	Biyagama 01 Energized	13:35:58
2	Kothmale	Gen 03 Resumed	13:39:25
3	Biyagama	Kotmale 1 energized	13:40:34
4	Biyagama	Kotugoda 02 energized	13:41:14
5	Kotugoda	Biyagama 02 energized	13:47:33
6	Kotugoda	220/132/33 kV TF 01 energized	13:49:25
7	Kotugoda	33kV F4 energized	13:54:24
8	Kotugoda	33kV F8 energized	13:55:02
9	Kotugoda	33kV F9 energized	13:56:20
10	Kotugoda	Aniyakanda line energized	13:58:28
11	Aniyakanda	GSS supply received	13:59:58
12	Aniyakanda	33kV F4/ F5 energized	14:01/14:02
12	Kothmale	frequency, voltage stable at 27 MW / 4MVar leading	
13	Biyagama	Sapugaskanda 02 energized	14:04:43
		Frequency oscillation observed from 14:05 hrs	
14	Sapugaskanda	TF 02/ TF 04 denergized	14:05:23/14:05:28
15	Aniyakanda	33kV feeder 05 tripped	14:05:46
16	Sapugaskanda	Biyagama 02 energized	14:05:57
	Kothmale	Gen 03 / tripped	14:06:01
		Tripped due to over frequency (Generator protection 81O) 22 MW & 3 MVar lagging at the time of tripping	

4th attempt -Biyagama Frequency vs Kotmale unit 03





Biyagama BEN

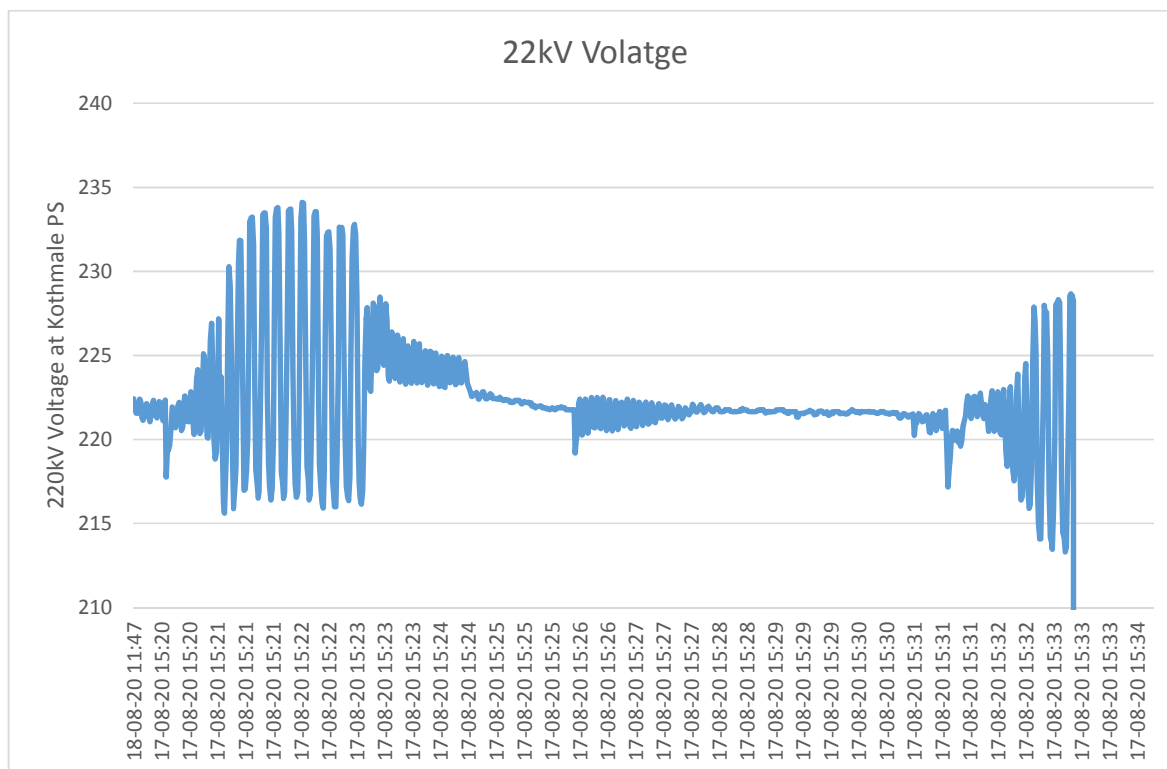
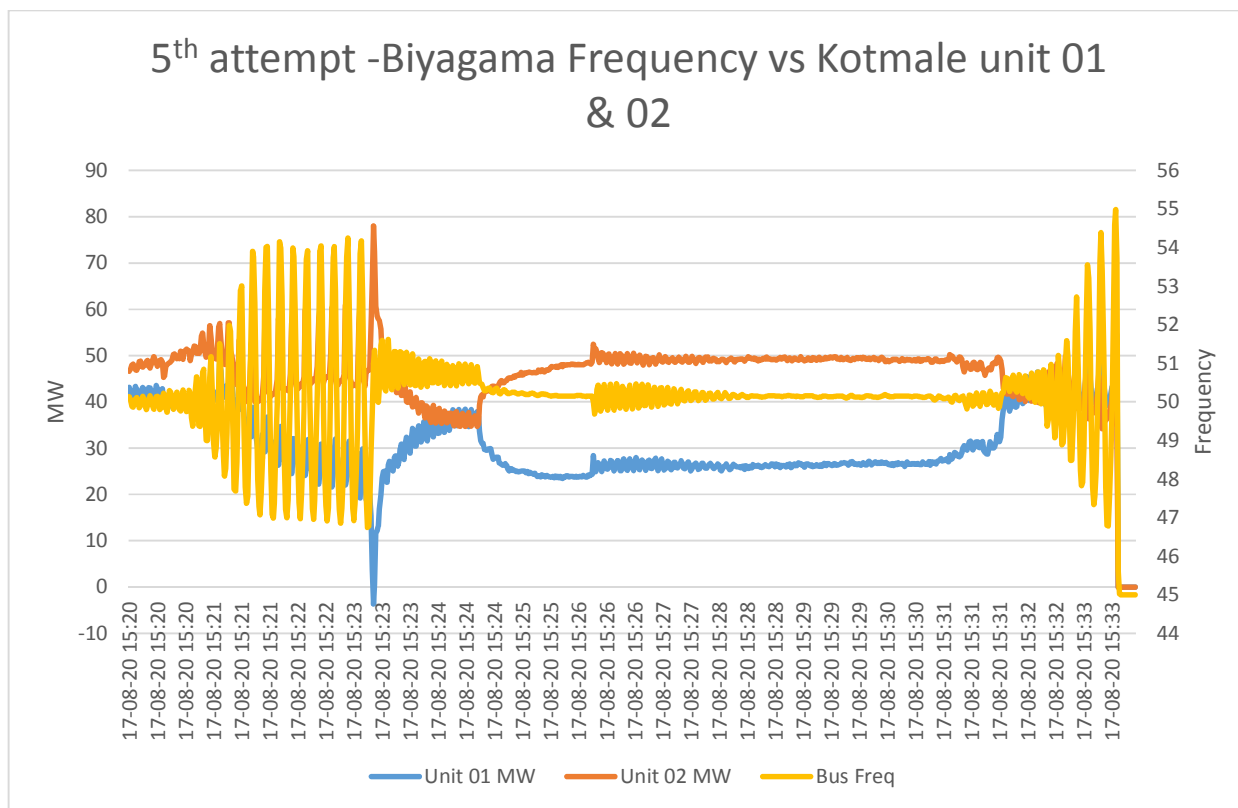
System Control Comments:

Severe frequency oscillation observed from 14:05 hrs and no significant action identified for cause of frequency oscillation. Governor was at Auto ep1 (2%)

5th Attempt: From Kotmale Generator 01

No	Location	Equipment	Time
1	Kothmale	Biyagama 01 remain ON	
2	Kothmale	Gen 01 synchronized	14:19:35
3	Biyagama	Kotmale 01 energized	14:20:38
4	Biyagama	Kotugoda 01 energized	14:21:24
5	Kotugoda	Biyagama 01 energized	14:23:30
6	Kotugoda	220/132/33 kV TF 02 energized	14:27:37
7	Kotugoda	33kV F4, F9, F8 energized	14:26/14:27
8	Kotugoda	Aniyakanda line energized	14:28:32
9	Aniyakanda	Kotugoda line energized	14:29:17
10	Aniyakanda	33kV F4 energized	14:30
11	Kotugoda	33kV F10 /13 energized	14:31/ 14:33
12	Aniyakanda	33kV F5 energized	14:34
13	Kotugoda	Kelniya line energized	14:36:26
14	Kelaniya	Aniyakanda line energized	14:40:21
15	Aniyakanda	Kelaniya line energized	14:41:30
16	Kotugoda	Katunayaka 01 energized	14:44:04
17	Katunayaka	Kotugda 01 energized	14:45:08
18	Pannala	Supply received via Katunayaka	14:47
19	Kotugoda	Katunayaka 01 energized	14:44:04
		Katunayaka SCADA Fail. Hence No events recorded	
20			
21	Kelaniya	Kolonnawa 01 energized	14:49:12
22	Katunayaka	Pannala line energized	14:49:53
23	Pannala	Supply received	14:49:53
24	Kelaniya	Sapugaskanda 01 energized	14:50:15
25	Kolonnawa	Kelaniya 01 energized	14:52:52
26	Sapugaskanda	Kelaniya 01 energized	14:54:00
27	Kotmale	Gen 02 synchronized	14:51:21
28	Pannala	33kV feeder F5,F3	
29	Bolawatta	33kV feeder F1,F2	15:02
30	Sapugaskanda	33kV feeder F10,F8,F1	15:01
31	New Chilaw	Katunayaka line energized	15:06:13
32	New Chilaw	Chilaw 01 energized	15:07:40
33	Biyagama	Kelanithissa 01 energized	15:08:15
34	Biyagama	Kotmale 02 energized	15:12:01
35	Biyagama	Kotugoda 02 energized	15:12:34
36	Kotugoda	Biyagama 02 energized	15:13:39
37	New Chilaw	220kV Bus energized via TF 01 from 132kV side	15:14:00
38	Kelaniya	Kotuoda 01 energized	15:14:33
39	New Chilaw	Veyangoda 01 energized	15:14:53
40	Kelaniya	Sapugaskand 02 energized	15:15:43
41	Kotmale	Victoria 01 energized	15:18:06
42	Veyangoda	New Chilaw 01 energized	15:18:20
43	Victoria	Kotmale 01 energized	15:19:23
44	Kelanithissa	Biyagama 01 energized	15:20:32
45	New Chilaw	Veyangoda 01 de-energized	15:23:28
46	Veyangoda	New Chilaw 01 de-energized	15:25:33
	Kothmale two units	88 MW & 9 MVar lagging at the time of tripping	15:33:34
		Tripping due to over frequency (Generator protection 810)	

**Kelanithissa SCADA event list not available

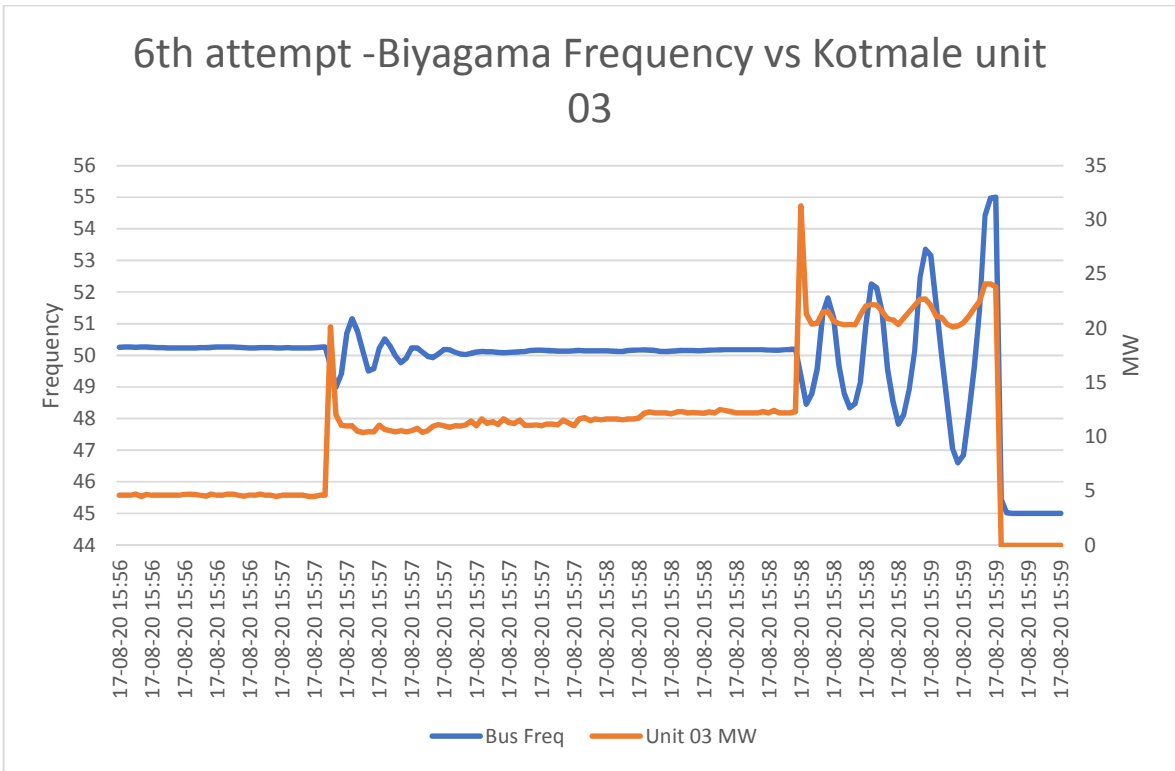


System Control Comments:

Severe frequency oscillation observed from 15:20 hrs and no significant action identified for cause of frequency oscillation. Event list shows CB switchings just before the oscillation started. Unit 01 and 02 Governor was at Auto ep2 (8%) and Auto ep1 (2%) respectively.

6th Attempt: From Kotmale Generator 01

No	Location	Equipment	Time
1	Kothmale	Biyagama 01 energized	15:41:53
2	Kothmale	Gen 03 Resumed	15:42:53
3	Biyagama	Kotmale 01 energized	15:43:39
4	Biyagama	Sapugaskanda GSS 01	15:44:08
5	Sapugaskanda	GSS supply received	15:44:46
6	Sapugaskanda	33kV F 10 energized	15:47:38
7	Kothmale	BB 02 energized	15:49:01
8	Sapugaskanda	33kV F 8 energized	15:50:02
9	Sapugaskanda	33kV F 1 energized	15:52:09
10	Biyagama	Kotugoda 02 energized	15:52:32
11	Kotugoda	Biyagama 02 energized	15:53:09
12	Kotugoda	220/132/33 TF 02 energized	15:53:35
13	Kotugoda	33kV F4	15:55:04
14	Kotugoda	33kV F8 (5.8 MW)	15:56:52
15	Kotugoda	33kV F9 (8 MW)	15:58:24
16	Kothmale	Gen 03 / tripped	15:59:20
9		23 MW and 14 MVar leading at the time of tripping	
		Tripping due to over frequency (Generator protection 81O)	



System Control Comments:

Later observations noted that severe frequency drop followed by oscillation observed from 15:58hrs as Kotugoda 33kV feeder 08 energized with 8 MW. Frequency oscillation increased and machine tripped. Governor was at Auto ep1 (2%).