

C.E. (System Control Centre),

## REPORT ON SYSTEM DISTURBANCE / PLANT FAILURE

Power Station: **Kotmale Power Station**

Date: 25/02/2016

Time: 14:00 hrs

### 1. Failure at a Glance:

- Kotmale Unit 2 was running.
- Kotmale Unit 2 tripped due to Generator Protection Operated.
- All the 220 kV breakers in switch yard were in closed position except CB 110 & CB 130 (Opened by requested by SCC at 13:56) and no lines were tripped.
- System failure. (Confirmed by SCC)

### 2. Pre Fault Conditions:

#### (a) Generators:

Note:

Active and reactive power values in the below table are taken from the trend graphs on SCADA and the voltage value is an observed value by the operator. (SCADA time – 14:00:00)

Unit No.	MW	MVAr	Voltage kV	AVR Auto/Manual	Governor Auto/Manual	Remarks
01	-	-	-	-	-	-
02	71.0	05.5	14.0	Auto	Auto	ep 2
03	-	-	-	-	-	-

#### (b) Transmission Lines:

Note:

Values in the below table are taken from the trend graphs on SCADA. (SCADA time – 14:00:00)

Transmission Line	MW	MVAr	A	kV
Victoria 1	-1.8	7.3	24	232.8
Victoria 2	-2.6	6.9	22	231.5
Anuradhapura 1	-1.2	-1.5	0	3.0
Anuradhapura 2	12.3	4.7	34	231.0
Upper Kotmale 1	-27.4	1.1	61	232.3
Upper Kotmale 2	-27.2	3.1	63	232.7
Biyagama 1	52.3	11.5	137	230.6
Biyagama 2	51.6	12.4	141	230.6

3. Nature of failure:

Equipment	Auto/Man trip	Time of tripping	Indications/Remarks
Unit 2	Auto	14:00:01	<p>Control Room: -</p> <ul style="list-style-type: none"> <li>- Electrical Trip Relay Operated</li> <li>- Mechanical Trip Relay Operated</li> <li>- Gov. Oil System Abnormal</li> <li>- Non Urgent Electrical Fault</li> <li>- Non Urgent Mechanical Fault</li> </ul> <p>PH Annunciation Panel:</p> <ul style="list-style-type: none"> <li>- Generator Protection Operated</li> <li>- Turbine Governor Fault</li> <li>- Inlet Valve Closing Trip</li> <li>- Guide Vane Equipment Zero Voltage</li> <li>- Oil Pressure pump fault</li> <li>- 400V VT Fuse Failure</li> </ul> <p>F881 (REG 670 Relay):</p> <ul style="list-style-type: none"> <li>- 1 R General Trip</li> <li>- 810 Over Frequency</li> </ul> <p>Common Panel</p> <ul style="list-style-type: none"> <li>- Non Ess. Aux Supply Fail</li> <li>- 230 V AC Fuse Fail</li> <li>- 220 V DC Bat Charger 2 Fail</li> <li>- Ess. Aux Supply Fail</li> </ul>
Unit 3	N/A	N/A	<p>Control Room:</p> <ul style="list-style-type: none"> <li>- Non Urgent Electrical Fault</li> </ul>
Unit 1	N/A	N/A	Taken for scheduled outage.
U3 T/F	N/A	N/A	<p>Relay Room:</p> <p>F87T Gen T/F</p> <ul style="list-style-type: none"> <li>- 2. Relay Pickup</li> <li>- 9. Second Harmonic BLK</li> </ul> <p>F87T Generator Cable</p> <ul style="list-style-type: none"> <li>- 2. Relay Pickup</li> <li>- 9. Second Harmonic BLK</li> </ul>
U2 T/F	N/A	N/A	<p>Relay Room:</p> <p>F87T Gen T/F</p> <ul style="list-style-type: none"> <li>- 2. Relay Pickup</li> <li>- 9. Second Harmonic BLK</li> </ul> <p>F87T Generator Cable</p> <ul style="list-style-type: none"> <li>- 2. Relay Pickup</li> </ul>

#### 4. Failure/Restoration

Equipment	Failed/Restored time
CB 120	Opened at 14:13 hrs
CB 210, 230, 220, 310, 330, 320	Opened at 14:14 hrs
CB 410, 430, 610, 630	Opened at 14:14 hrs
KOT U2	Started at 14:18 hrs and at 14:21 hrs connected with Biyagama Line 1 to charge the line
KOT U3	Started at 14:25 hrs ( under spinning stage)
VIC Line 2 – ON	CB 220 Closed at 14:36 hrs under instruction of SCC
KOT U3	Synchronized at 14:50 hrs
Biya Line 2 - Energized	CB 610 closed at 15:04 hrs under instruction of SCC
KOT U3	Tripped at 15:04 Due to Gov. Oil Pressure Low.
VIC Line 1 – ON	CB 120 Closed at 15:07 hrs under instruction of SCC
KOT U3	Started at 15:18 hrs and Synchronized at 15:27 hrs
U Kot Line 1 – ON	CB 310 closed at 15:38 hrs
UKT U2	Synchronized at 16:00 hrs
CB 630	Closed at 16:06 hrs
CB 320, CB 330	Closed at 16:08 hrs
Anu Line 1 ON	CB 110 & CB 130 Closed at 16:17 hrs
U Kot Line 2 ON	CB 410 & CB 430 Closed at 16:36 hrs

#### 5. Brief description of incident by officer in charge [OEE] at that time:

At 14:00 hrs Kotmale Unit 2 and Upper Kotmale Unit 2 was running. Both Upper Kotmale Unit 2 and Kotmale Unit 2 tripped and a blackout was confirmed by SCC.

Initially the line charging was done using Kotmale Unit 2 generator at 14:21 hrs. At 14:25 hrs Unit 3 generator also connected to the system. But Unit 3 was tripped at 15:04 and it was allowed to complete the stop sequence of unit 3. As per the request, Unit 3 Start again and synchronized with system at 15:27 successfully.

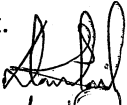
Line charging was done by Kotmale Unit 2 at 14:21 hrs. After line charging, rest were restored as per the table above (4. Failure/Restoration).

#### 6. Observation of the officer in charge (at the time of incident).

	Yes/No	Action Taken
Operation errors	No	Not relevant
Equipment malfunction	No	Not relevant
System Disturbance	No	Not relevant
Any Other	Yes	Outside disturbance

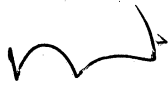
7. Remedial action taken to avoid reoccurrence of such failure / [EE(M)'s note]:

The tripping may be due to outside fault. No faults were detected / observed in the Kotmale machines and Kotmale Switch Yard equipment.

  
25/02/2016.

8. Remarks

unit no 02 has been tripped due to an outside fault.



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Officer In-Charge of the Power Station

Date: 25-02-2016

**CHIEF ENGINEER**  
Kotmale Power Station  
Ceylon Electricity Board  
MAWATURA

Copy: DGM (MC) – f.i. Pl.