

C.E. (System Control Centre),



REPORT ON SYSTEM DISTURBANCE / PLANT FAILURE

Power Station: **Kotmale Power Station** Date: 28/09/2014

Time: 14:50 hrs

Failure at a Glance: At 14:50 hrs, Unit 01 at Kotmale power Station tripped with indication Electrical Trip Relay (substation protection and shaft current protection) operated and Transformer protection operated (Low Voltage side Restricted earth fault -11kV).

Pre-fault condition:

Generators

Unit No.	MW	MVar	Voltage kV	AVR on/off	Governor	Remarks
01	25	38	13.8	ON	Auto,ep1	Frequency control
02	-	-	-	-	-	A/M
03	57	20	14.0	ON	Auto,ep2	-

Transmission Lines

Transmission Line	MVar	MW	A	kV
Vic 01	7	-1	23	225
Vic 02	6	-2	22	224
Anu 01	8	-53	137	223
Anu 02	8	-52	136	223
UK 01	47	102	290	224
UK 02	-	-	-	227
Biy 01	-	-	-	-
Biy 02	-109	-111	430	223

(b). Nature of failure:

Equipment	Auto/ Man trip	Time of tripping	Indications/Remarks
Unit 01	Auto	14:50 hrs	At Power House Red Indications: <ul style="list-style-type: none">• Substation protection operated• Shaft current protection operated White indications: N/A At Control Room White Indications: <ul style="list-style-type: none">• Transformer protection operated.• VT fuse failure
RAA1-U01 Gen-01 Protection Panel (siprotec 7UT61)		14:50hrs	F87T- 2-Relay Pickup, 8-2 nd Harmonic Blk, 9-5 th Harmonic Blk F87N-1- Relay trip 2- Relay pickup 8-LV REF
220kV/13.8kV GEN TRAFO-1 (siprotec 7UT63)		14:50hrs	F87T- 2-Relay Pickup,
RAA1-U03 Gen-01 Protection Panel (siprotec 7UT61)		14:50hrs	F87T- 2-Relay Pickup, 8-2 nd Harmonic Blk, 9-5 th Harmonic Blk F87N-2- Relay pickup
Upper Kotmale Line 01			VT Fuse Failed CB330 Sync, Blocked
HAD 03 (11kV)		14:50hrs	Alarm unit: protection operated
HAD 01 (11kV)		14:50hrs	Earth Fault protection operated

3. Restoration

Equipment	Restored time
Unit 01	15:19 hrs(28/09/2014)

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

The Unit 01 which was at frequency control operation tripped at 14:50 hrs on 28/09/2014. The indications were Electrical trip relay operated/substation protection operated. The incident has been triggered by the Low Voltage restricted earth-fault protection system of the unit 01 earthing and auxiliary power transformer (11kV side). However at the same time HAD 01 which is used to power the overhead 11 kV line (to Building and Dam site) has been tripped with earth fault. Heavy lightning strike was observed just before the tripping.

Prior to above incident there was a special arrangement in Kotmale switch yard. The arrangement was permitted to Eng. Harshana (transmission project branch) by system control. This arrangement was configured to use the busbar 01 as a permanent connection to CB510 (biyagama line 01) and CB110 used to provide protection for biyagama line 01. When above incident taking place, CB 110 was opened for protection scheme configuration works. Secondly, there was another permit to isolate CB 430 and CB 420 for Generator transformer protection upgrade work.

The reason for the energizing upper Kotmale line 02 from using busbar 01 for a short period of time was the observed full load utilization of the upper Kotmale plant (150MW). The purpose was to provide both lines while protection schemes were reconfiguring. However due to unit one tripping, the only available link to bus bar 02 (CB330 via CB310) was disconnected and both upperkotmale line 01 and 02 were disconnected from the grid. Please note that CB 530 was also isolated for Biyagama line 01 protection upgrade works.

OE
28/09/2014

5. Remedial actions taken to avoid reoccurrence of such failure / [EE (C&I/ EEM)'s note]:

Tripping may occurred due to lightning. REF stability shall be rechecked by the Protection branch.

Shaft current protection alarm triggering is under investigation.

[Signature]
29/09/2014

6. Remarks

REF operation may be due to lightning strike relay must be check by protection branch. Shaft current protection operation under investigation.

[Signature]

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Officer In-Charge of the Power Station

Date: 2014/09/28

CHIEF ENGINEER

Kotmale Power Station

Copy: DGM (MC) - f.i. Pylon, Electricity Board

MAWATURA