

C.E. (System Control Centre),

REPORT ON SYSTEM DISTURBANCE / PLANT FAILURE

Power Station: Kotmale Power Station Date: 29/11/2021 Time: 19:25 hrs

Failure at a Glance: At 19:25 hrs,
Kotmale - Biyagama Line 1 tripped from Kotmale end,
Kotmale - Biyagama Line 2 tripped from Biyagama end,
Kotmale - Upper Kotmale Line 1 and 2 tripped from Upper Kotmale end,
Kotmale - Victoria Line 1 and 02 tripped from Victoria end,
Kotmale - New Habarana Line 02 tripped from Kotmale end,
Kotmale - New Habarana Line 01 was already interrupted.

Pre-fault condition:

Generators:

Readings at: 19:00 hrs

Unit No.	MW	MVar	Voltage kV	AVR on/off	Governor	Remarks
01	36	15	13.2	on	Auto/eP2	Running
02	30	10	13.6	on	Auto/ep1	Running with frequency control
03	32	13	13.7	on	Auto/ep2	Running

Transmission Lines:

Readings at: 19:00 hrs

Transmission Line	MVar	MW	A	kV
Vic 01	02	131	361	221
Vic 02	0	130	358	220
New Habarana 01	interruption			
New Habarana 02	19	-48	132	219
UK 01	2	77	196	220
UK 02	1	78	200	220
Biy 01	-25	-224	668	219
Biy 02	-30	-242	672	219

(b). Nature of failure:

Equipment	Auto/Man trip	Time of tripping	Indications/Remarks
Biyagama 1	Auto	19:25 hrs	At Relay Room: <ul style="list-style-type: none">• F871 Diff Main 1 Relay<ul style="list-style-type: none">○ General Trip○ R Pickup○ Y Pickup○ B pickup

			<ul style="list-style-type: none"> ○ N Pickup ○ Diff. Trip • F872 Main 2 Protection <ul style="list-style-type: none"> ○ R Pickup ○ Y Pickup ○ B pickup ○ N Pickup ○ Diff. Trip ○ Trip ○ DT service ○ Carrier service ○ Zone1/1B trip
Biyagama 2	Tripped only from Far End	19.25	<p>At Relay Room:</p> <ul style="list-style-type: none"> • F871 Diff Main 1 relay <ul style="list-style-type: none"> ○ General Trip ○ R Pickup ○ B Pickup ○ N Pickup ○ Diff. Trip ○ Zone 01/Z1B trip • F872 Diff Main 2 Relay <ul style="list-style-type: none"> ○ R Pickup ○ B Pickup ○ N Pickup ○ Diff. Trip ○ Zone1/1B trip ○ Trip ○ Carrier Send ○ Carrier Received
Victoria 1	Tripped only from Far End	19.25	<p>At Relay Room:</p> <ul style="list-style-type: none"> • F871 Diff Main 01 <ul style="list-style-type: none"> ○ B Pickup ○ N Pickup ○ 21/67 NCR received
Victoria 2	Tripped only from Far End	19.25	<p>At Relay Room:</p> <ul style="list-style-type: none"> • F871 Diff Main 1 Relay <ul style="list-style-type: none"> ○ B Pickup ○ N Pickup ○ 21/67 NCR received • F872 Diff Main 2 Relay <ul style="list-style-type: none"> ○ Bph Pickup ○ 21/67 NCR received
Upper Kotmale 1	Tripped only from Far End	19.25	<p>At Relay Room:</p> <ul style="list-style-type: none"> • Main 1 protection Relay <ul style="list-style-type: none"> ○ Ground Fault
Upper Kotmale 2	Tripped only from Far End	19.25	<ul style="list-style-type: none"> • Main 1 protection Relay <ul style="list-style-type: none"> ○ Ground Fault

New Habarana 1	N/A	N/A	<ul style="list-style-type: none"> • Already at OFF position
New Habarana 2	Auto	19.25	<ul style="list-style-type: none"> • F871 Diff Main 1 Relay <ul style="list-style-type: none"> ○ R Pickup ○ Y Pickup ○ B Pickup ○ N Pickup • F872 Relay <ul style="list-style-type: none"> ○ R Pickup ○ Y Pickup ○ B Pickup ○ N Pickup ○ Stub Trip / Def Trip ○ Carrier Send
U1 Generator	GCB Opened. Remained at spinning mode	19.25	<p>At Power Station:</p> <ul style="list-style-type: none"> • F871 Relay <ul style="list-style-type: none"> ○ 07Y 81O/81U ○ 81O/81U Over Frequency / Under Frequency • F881 Relay <ul style="list-style-type: none"> ○ General Trip ○ 81O/81U Over/Under Frequency ○ protection group alarm 1. 78 – Pole Slip 2. 50/27 – Inadvertent Energization 3. 64R – Rotor Earth Fault 4. 60FL – VT Fuse Failure
U2 Generator	GCB Opened. Remained at spinning mode	19.25	<p>At Power Station:</p> <ul style="list-style-type: none"> • F871 Relay <ul style="list-style-type: none"> ○ 07Y 81O/81U ○ 81O/81U Over Frequency / Under Frequency • F881 Relay <ul style="list-style-type: none"> ○ General Trip ○ 81O/81U Over/Under Frequency ○ protection group alarm 1. 78 – Pole Slip 2. 50/27 – Inadvertent Energization 3. 64R – Rotor Earth Fault 4. 60FL – VT Fuse Failure

U3 Generator	GCB Opened. Remained at spinning mode	19.25	At Power Station: <ul style="list-style-type: none"> • F871 Relay <ul style="list-style-type: none"> ○ 07Y 81O/81U ○ 81O/81U Over Frequency / Under Frequency • F881 Relay <ul style="list-style-type: none"> ○ General Trip ○ 81O/81U Over/Under Frequency ○ protection group alarm <ol style="list-style-type: none"> 1. 78 – Pole Slip 2. 50/27 – Inadvertent Energization 3. 64R – Rotor Earth Fault 4. 60FL – VT Fuse Failure
U1 Generator Transformer	N/A	19.25	<ul style="list-style-type: none"> • F87T – TR Diff Relay <ul style="list-style-type: none"> ○ General Trip • F87N – TR Ref Relay <ul style="list-style-type: none"> ○ Relay Pickup
U2 Generator Transformer	N/A	19.25	<ul style="list-style-type: none"> • F87T – TR Diff Relay <ul style="list-style-type: none"> ○ General Trip • F87N – TR Ref Relay <ul style="list-style-type: none"> ○ Relay Pickup
U3 Generator Transformer	N/A	19.25	<ul style="list-style-type: none"> • F87T – TR Diff Relay <ul style="list-style-type: none"> ○ General Trip • F87N – TR Ref Relay <ul style="list-style-type: none"> ○ Relay Pickup
U1 Generator Cable	N/A	19.25	<ul style="list-style-type: none"> • RED 670 Relay <ul style="list-style-type: none"> ○ F881 Trip – Alarm Pickup ○ GCB Rem Trip
U2 Generator Cable	N/A	19.25	<ul style="list-style-type: none"> • RED 670 Relay <ul style="list-style-type: none"> ○ F881 Trip – Alarm Pickup ○ GCB Rem Trip
U3 Generator Cable	N/A	19.25	<ul style="list-style-type: none"> • RED 670 Relay <ul style="list-style-type: none"> ○ F881 Trip – Alarm Pickup ○ GCB Rem Trip

3. Restoration

Equipment	Restored time
Biyagama 1	20:36
Biyagama 2	19:56
Victoriya 1	20:24
Victoriya 2	21:12
New Habarana 1	Interrupted
New Habarana 2	23:21
Upper Kotmale 1	N/A
Upper Kotmale 2	N/A
Unit 03	20:18
Unit 01	20:31
Unit 02	20:41

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

At 19:25 hrs Kotmale- Biyagama Line 1 tripped from Kotmale end, Kotmale- Biyagama Line 2 tripped from Biyagama end and New Habarana Line 2 tripped from Kotmale end with above main protections and other all lines were tripped from far end. At that time of tripping Kotmale U01, U02 and U03 were running while U02 was performing frequency control. Just after the tripping of above transmission lines, system frequency enormously raised (as observed from SCADA), resulting synchronizing breakers of all generators opened automatically with triggering over frequency & all machines remained at spinning. Informed SCC and restored the lines and machines after clearing all the indication as per the instructions by SCC accordingly.

f.f.y
ENG. J.A.S. Jayasinghe

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

This is due to an outside disturbance.

VSD
Eng. D.M.U.J. DASSANAYAKA
EE(M) - KOTMALE PS

6. Remarks

This is due to an outside disturbance

K.M.I.N.
Officer In-Charge of the Power Station
Eng K.M.I.N. KURUPPU
CHIEF ENGINEER
KOTMALE POWER STATION

Date: 30/11/2021

Copy: DGM (MC) - f.i. PI.