

Grid Occurrences – 145

I. Details of Grid Disturbances

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
1	Complete Outage of 400kV SEPC Generating station of SEPC	During antecedent conditions, the 400kV Ottapidaram–SEPC-1 line was under outage and 400kV SEPC is radially connected through 400kV Ottapidaram–SEPC-2. As per the reports submitted, the triggering incident was the maloperation of SF6 gas low-pressure trip indication in the Bus-2 G2 compartment at the SEPC end and 400kV Ottapidaram–SEPC-2 line tripped. Tripping of the only line connected to 400kV SEPC led to the Complete Outage of 400kV SEPC. There was no generation during the event.	08-06-2026 11:42	0	0	GD - 1	25-06-2026	13-07-2026	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During antecedent conditions, the 400kV Ottapidaram–SEPC-1 line was under outage and 400kV SEPC is radially connected through 400kV Ottapidaram–SEPC-2. As per the reports submitted, the triggering incident was the maloperation of SF6 gas low-pressure trip indication in the Bus-2 G2 compartment at the SEPC end and 400kV Ottapidaram–SEPC-2 line tripped. Tripping of the only line connected to 400kV SEPC led to the Complete Outage of 400kV SEPC. There was no generation during the event.

2. Time and Date of the Event (घटना का समय और दिनांक): 08-06-2026 11:42

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): TAMILNADU

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
TamilNadu State Demand (MW)	16742	16674
TamilNadu State Generation (MW)	14730	14764
Grid Frequency (Hz)	50.0	50.02
SR Demand (MW)	55692	55625
SR Generation (MW)	57806	58028

**Pre and post data of 1 minute before and after the event*

Elements under outage	1. 400KV-OTTAPIDARAM-SEPC-1
Weather Condition (मौसम स्थिति)	Normal

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

7. Duration of interruption (रुकावट की अवधि): 10 hours, 19 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

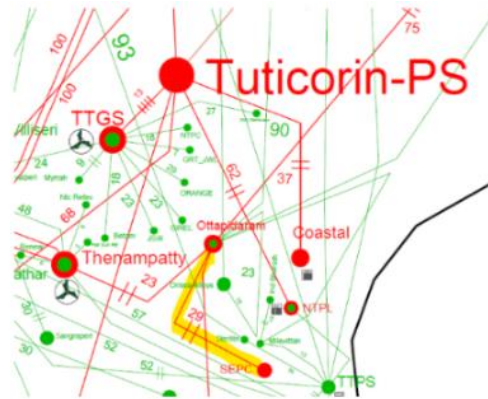
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV-OTTAPIDARAM-SEPC-2
2. 400KV/21KV SEPC-GT-1

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

During antecedent conditions, the 400kV Ottapidaram–SEPC-1 line was under outage and 400kV SEPC is radially connected through 400kV Ottapidaram–SEPC-2. As per the reports submitted, the triggering incident was the maloperation of SF6 gas low-pressure trip indication in the Bus-2 G2 compartment at the

SEPC end, caused by low insulation resistance (IR) in the secondary control cable between the gas density switch and the Local Control Cabinet (LCC) and the line tripped at SEPC end (as per detailed report) and Direct Trip was sent to remote end. At the OTTAPIDARAM end, the Direct Trip signal was received and 3ph tripped, tripping the 400kV Ottapidaram–SEPC-2 line. Tripping of the only line connected to 400kV SEPC led to the Complete Outage of 400kV SEPC. There was no generation during the event.



11. DR Analysis:

400KV-OTTAPIDARAM-SEPC-2

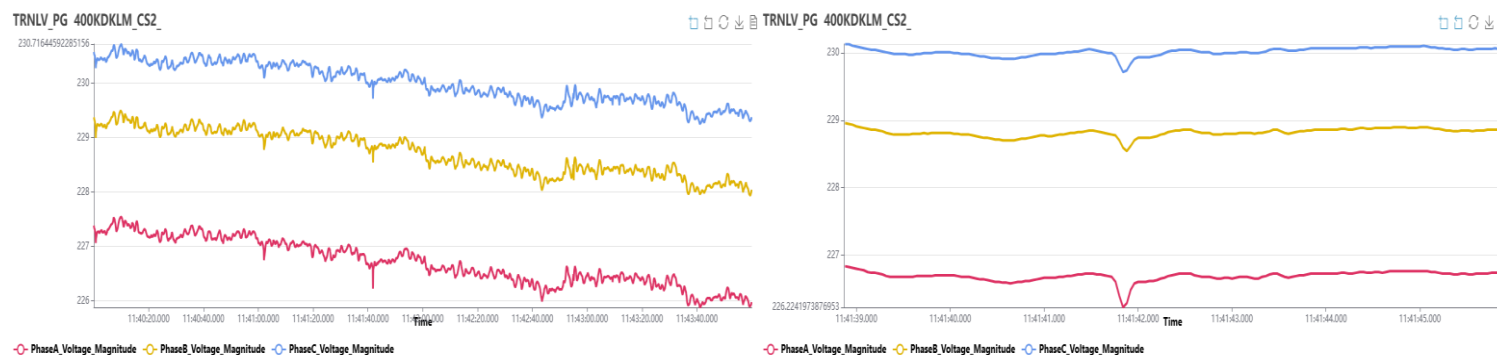
	OTTAPIDARAM - 400KV	SEPC - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:08-06-2026 11:42:00.763 DIC1 DT RCV 1, DIC1 DT RCV 1 BLK_CMD1 DIA2 MCB Y OP, DIA3 MCB B OP DIA1 MCB R OP Ir (max): 0.03 kA Iy (max): 0.03 kA Ib (max): 0.03 kA	DR is not uploaded

	Vr (max): 233.95 kV Vy (max): 235.81 kV Vb (max): 258.50 kV	
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SEPC - 400KV

	SEPC - 400KV
Time Sync Issue	No
DR Analysis	Supply Failure

12. A) PMU Analysis:



From the PMU plot, no fault can be observed during the event

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
SEPC	1. Tripping of the line due to cable issue needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions

SEPC	The damaged cable was replaced, alarm was cleared and system restored to normal
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15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details: 08/06/2026 22:01

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl.No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	SEPC
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	SEPC
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	SEPC
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
08-06-2026 11:42:07	SEPC TUTICORIN CB 40552 (LINE-2 TO OTPM4) OPEN	SEPC4_TG
08-06-2026 11:42:18	OTTAPIDARAM 400 CB TIE 10 - CB 41052 OPEN	OTPM4_TN
08-06-2026 11:43:34	SEPC TUTICORIN CB CB 40252 (GT-1) OPEN	SEPC4_TG

Deliberations:

1. SEPC stated that, under the antecedent conditions, the 400 kV Ottapidaram–SEPC-1 line was under outage and the 400 kV SEPC Substation was being fed radially through the 400 kV Ottapidaram–SEPC-2 line.
2. SEPC stated that the triggering incident was the maloperation of the SF6 gas low-pressure trip indication in the Bus-2 G2 compartment at the SEPC end. As per the detailed report, the maloperation was caused by low insulation resistance (IR) in the secondary control cable between the gas density switch and the Local Control Cabinet (LCC). Consequently, the line tripped at the SEPC end and a Direct Trip (DT) signal was sent to the remote end.
3. At the Ottapidaram end, the DT signal was received and three-pole tripping occurred, resulting in the tripping of the 400 kV Ottapidaram–SEPC-2 line. Since this was the only line feeding the 400 kV SEPC Substation, its tripping resulted in a complete outage of the 400 kV SEPC Substation. SEPC stated that there was no generation during the event.
4. SRLDC suggested SEPC to review the feasibility of disabling the gas density monitor trip function in the switchyard. SEPC stated that they would consult the OEM regarding the feasibility of disabling the function and update the forum.
5. SRPC suggested SEPC to undertake periodic testing and maintenance of the control cables associated with the SF6 gas density monitoring circuit to prevent recurrence of such incidents. SEPC agreed to the same.

Recommendations:

 ***SEPC to submit DR/EL/TAR***

 ***SEPC to do periodic testing and Maintainance of control cables of GD Monitor.***

 ***SEPC to consult OEM regarding disabling of tripping for GD Monitor. It can be set for alarm.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
2	Complete outage of 220kV RSRPL_Gadag PS of Renew and Tripping of 220kV Bus-2 of 400kV Gadag PSS of Indigrid	During antecedent conditions, 220kV Gadag_PS Bus-1 was under shutdown. As per the reports submitted, the triggering incident was R-G fault in 220kV Gadag_PS Bus-2 and all elements connected to 220kV Bus-2 tripped. Since 220kV RSRPL_Gadag PS was radially connected to 220kV Bus-2 Gadag_PSS, tripping of 220kV Bus-2 of 220kV Gadag_PS led to complete outage of 220kV RSRPL_Gadag PS.	23-06-2026 14:17	263	0	GD - 1	22-07-2026	15-07-2026 & 04-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During antecedent conditions, 220kV Gadag_PS Bus-1 was under shutdown. As per the reports submitted, the triggering incident was R-G fault in 220kV Gadag_PS Bus-2 and all elements connected to 220kV Bus-2 tripped. Since 220kV RSRPL_Gadag PS was radially connected to 220kV Bus-2 Gadag_PSS, tripping of 220kV Bus-2 of 220kV Gadag_PS led to complete outage of 220kV RSRPL_Gadag PS.

2. Time and Date of the Event (घटना का समय और दिनांक): 23-06-2026 14:17

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): KARNATAKA

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Karnataka State Demand (MW)	12474	12358
Karnataka State Generation (MW)	10093	9967

Grid Frequency (Hz)	49.99	50.02
SR Demand (MW)	54563	56255
SR Generation (MW)	58250	59709

****Pre and post data of 1 minute before and after the event***

Elements under outage	1. GADAG_PSS - 220KV - Bus 1 2. 220KV-GADAG_PSS-Vena_GadagPS-1 3. 220KV-GADAG_PSS-Green Infra_GadagPS-1
Weather Condition (मौसम स्थिति)	Cloudy , Windy

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)		Load Loss (MW)
Solar	0.0 MW	0.0 MW
Wind	263.0 MW	
Others	0.0 MW	
Total	263.0 MW	

7. Duration of interruption (रुकावट की अवधि): 1 hours, 24 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

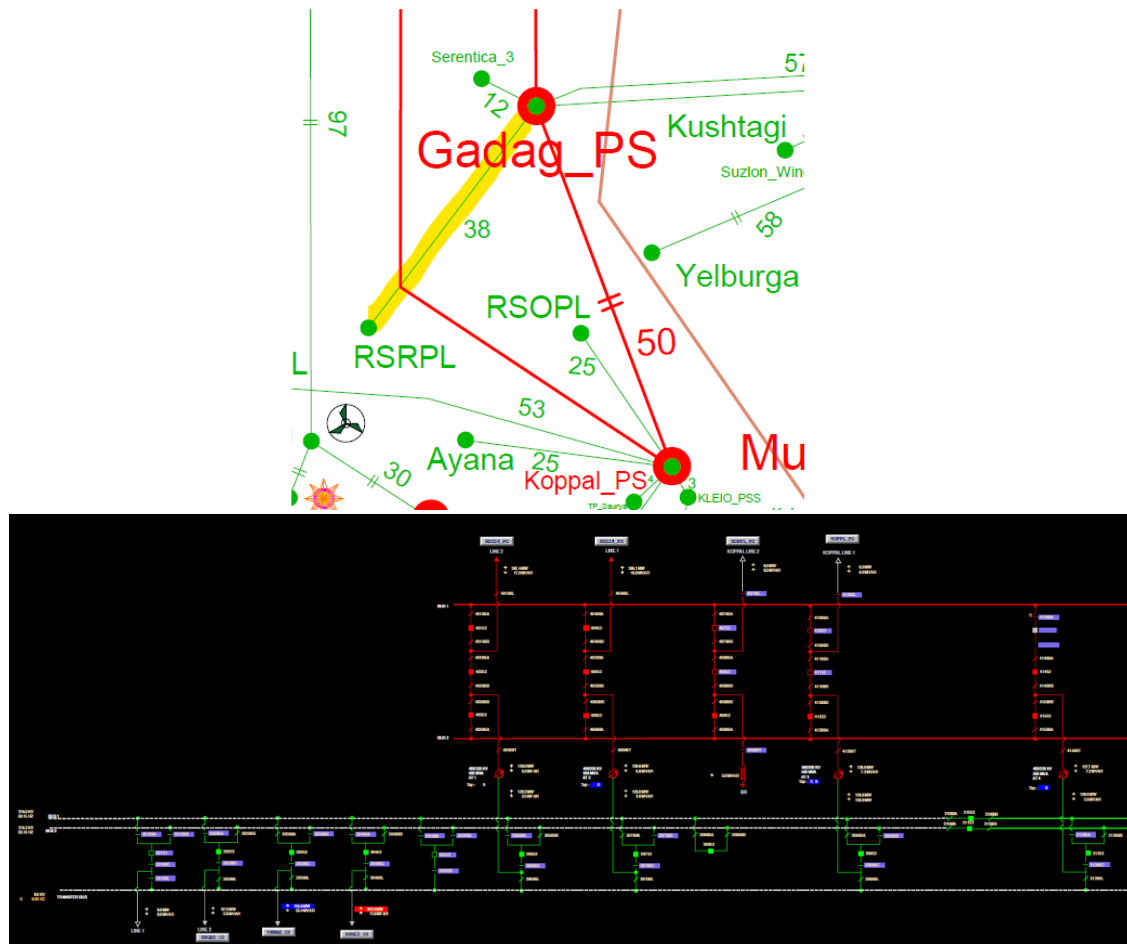
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV/220KV GADAG_PSS-ICT-1
2. 400KV/220KV GADAG_PSS-ICT-2
3. 400KV/220KV GADAG_PSS-ICT-3
4. 220KV-GADAG_PSS-RSRPL_GadagPS-1
5. RSRPL_GadagPS - 220KV
6. GADAG_PSS - 220KV - Bus 2

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

RSRPL_Gadag is radially connected to GADAG PSS through 220KV-GADAG_PSS-RSRPL_GadagPS-1. During the antecedent conditions, 220 kV Bus-1

of GADAG PSS was under shutdown for AMP work, further 220KV-GADAG_PSS-Vena_GadagPS-1 and 220KV-GADAG_PSS-Green Infra_GadagPS-1 lines were out from 17-05-2026 due to tower collapse.



Hence, RSRPL was radially connected through 220kV Bus-2 of Gadag. As per the reports submitted, the triggering incident is R-G fault on 220kV Bus-2 of GADAG PSS possibly due to movement of the tarpaulin which may have resulted in interference with live equipment and resulted in R-G fault in 220kV Bus-2.



This resulted in the operation of busbar differential protection and tripped all elements (ICT-1, ICT-2, ICT-3 and 220 kV Gadag PSS–RSRPL Gadag PS-1 line) connected to 220kV Bus-2 of GADAG PSS of Indigrid. Since RSRPL_Gadag was radially connected to GADAG PSS through 220 kV Gadag PSS–RSRPL Gadag PS-1 line, tripping of the only line led to the complete outage of RSRPL_GadagPS-220kV of Renew.

11. DR Analysis:

220KV-GADAG_PSS-RSRPL_GadagPS-1

	GADAG_PSS - 220KV	RSRPL_GadagPS - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:23-06-2026 14:18:16.906 MAIN1_Z1_OPTD BUSBAR_OPTD MAIN_CB_R_OPEN, MAIN_CB_Y_OPEN, MAIN_CB_B_OPEN, MAIN1_TRIP Ir (max): 1.14 kA Iy (max): 0.70 kA Ib (max): 0.94 kA Vr (max): 191.02 kV Vy (max): 191.07 kV Vb (max): 187.22 kV	DR Trigger Time:23-06-2026 14:18:16.918 Any Dist Start P Swing Detector Any Trip, V>1 Trip Ir (max): 1.12 kA Iy (max): 0.73 kA Ib (max): 0.93 kA Vr (max): 188.27 kV Vy (max): 187.76 kV Vb (max): 184.53 kV

400KV/220KV GADAG_PSS-ICT-2

	GADAG_PSS - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:23-06-2026 14:18:16.897 Any Trip, Trip 87BB, R9 BB OPTD L2 MN CB OPN Ir (max): 2.86 kA Iy (max): 0.22 kA Ib (max): 0.28 kA

400KV/220KV GADAG_PSS-ICT-1

	GADAG_PSS - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:23-06-2026 14:18:16.898 Any Trip, Trip 87BB, R9 BB OPTD L2 MN CB OPN Ir (max): 2.88 kA Iy (max): 0.22 kA Ib (max): 0.29 kA

RSRPL_GadagPS - 220KV

	RSRPL_GadagPS - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:23-06-2026 14:18:16.918 Any Dist Start P Swing Detector Any Trip, V>1 Trip Ir (max): 1.12 kA Iy (max): 0.73 kA Ib (max): 0.93 kA Vr (max): 188.27 kV Vy (max): 187.76 kV Vb (max): 184.53 kV

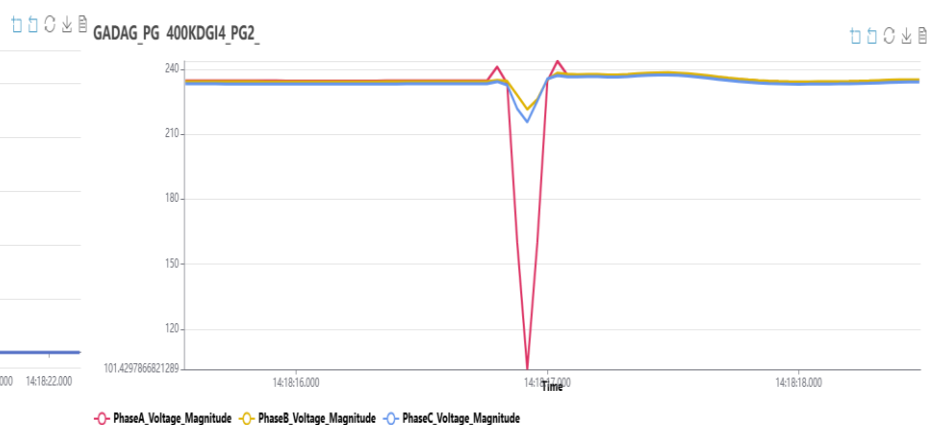
400KV/220KV GADAG_PSS-ICT-3

	GADAG_PSS - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:23-06-2026 14:18:16.898 Any Trip, Internal Trip, R1 MN CB TC-1 R, R2 MN CB TC-1 Y, R3 MN CB TC-1 B, Trip 87BB Ir (max): 3.27 kA Iy (max): 0.22 kA Ib (max): 0.29 kA

GADAG_PSS - 220KV

	GADAG_PSS - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:23-06-2026 14:18:16.897 Any Trip, Internal Trip, R1 CB TC 1 R PH, R2 CB TC 1 Y PH, R3 CB TC 1 B PH, Trip 87BB Ir (max): 13.21 kA Iy (max): 0.17 kA Ib (max): 0.13 kA

12. A) PMU Analysis:



From the PMU plot, R-G fault can be observed without any delayed fault clearing.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या): Nil

14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

1. 220 kV BUS-2 has been charged at 15:41Hrs.
Main Bay-204 of 220KV-GADAG_PSS-RSRPL_GADAGPS-1
400/220/33KV, 500MVA ICT-1 LV side has been charged at 15:53 Hrs.
400/220/33KV, 500MVA ICT-2 LV side has been charged at 15:54 Hrs.
400/220/33KV, 500MVA ICT-3 LV side has been charged at 15:56 Hrs.

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl.No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	RENEW POWER PVT LTD, INDIGRID
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	RENEW POWER PVT LTD, INDIGRID
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	RENEW POWER PVT LTD, INDIGRID
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
23-06-2026 14:18:19	GADAG CB 20952 (T3_S) OPEN	GADAG_PG
23-06-2026 14:18:19	GADAG CB 20752 (T2_S) OPEN	GADAG_PG
23-06-2026 14:18:19	GADAG CB COUPLER CB 21152 OPEN	GADAG_PG
23-06-2026 14:18:19	GADAG CB 20652 (T1_S) OPEN	GADAG_PG
23-06-2026 14:18:19	GADAG CB 20452 (LINE TO RSN22) OPEN	GADAG_PG

Deliberations:

There was no response from Indigrid during the agenda item discussion

Recommendations:

✚ M/s Indigrid to submit detailed report for the event.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
3	Tripping of 230kV Bus-1 Sriperambadur of TANTRANSCO and Complete Outage of 230kV Hyundai SS	230kV Hyundai station was radially fed from 230kV Bus-1 Sriperambadur SS. 230 kV Bus-1 and Bus-2 at Sriperambadur were in service and operating in split bus condition, with the bus coupler in the open condition. The triggering incident is the Y-G fault on the Hyundai feeder and led to the tripping of the line. Further jumper conductor failed between the CT and the circuit breaker snapped towards the CT side and Local Breaker Backup (LBB) operated in Bus-1 and all elements connected to Tripping of 230kV Bus-1 Sriperambadur of TANTRANSCO and with the tripping of 230kV Sriperambadur-Hyundai led to the complete outage of 230kV Hyundai station	05-07-2026 10:34	0	18	GD - 1	15-07-2026	15-07-2026 & 06-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

230kV Hyundai station was radially fed from 230kV Bus-1 Sriperambadur SS. 230 kV Bus-1 and Bus-2 at Sriperambadur were in service and operating in split bus condition, with the bus coupler in the open condition. The triggering incident is the Y-G fault on the Hyundai feeder and led to the tripping of the line. Further jumper conductor failed between the CT and the circuit breaker snapped towards the CT side and Local Breaker Backup (LBB) operated in Bus-1 and all elements connected to Tripping of 230kV Bus-1 Sriperambadur of TANTRANSCO and with the tripping of 230kV Sriperambadur-Hyundai led to the complete outage of 230kV Hyundai station

2. Time and Date of the Event (घटना का समय और दिनांक: 05-07-2026 10:34

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): TAMILNADU

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
TamilNadu State Demand (MW)	15336	15025
TamilNadu State Generation (MW)	16026	16166
Grid Frequency (Hz)	50.08	50.08
SR Demand (MW)	51362	50888
SR Generation (MW)	56274	56007

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

Bus 1 Connected Elements

1. 400KV/230KV SRIPERUMBADUR_TN-ICT-1
2. 400KV/230KV SRIPERUMBADUR_TN-ICT-2
3. 400KV/230KV SRIPERUMBADUR_TN-ICT-6
4. 230KV-SRIPERUMBADUR_TN-SURYA_DEV-1
5. 230KV-HYUNDAI-SRIPERUMBADUR_TN-1
6. 230KV-KADAPERI-SRIPERUMBADUR_TN-2
7. 230KV-SRIPERUMBADUR_TN-KANCHIPURAM-1
8. 230KV-KADAPERI-SRIPERUMBADUR_TN-1
9. 230KV-ORAGADAM-SRIPERUMBADUR_TN-1
10. 230KV-SRIPERUMBADUR_TN-THARAMANI-1
11. 230KV-KADAPERI-SRIPERUMBADUR_TN-1
12. 230KV-SRIPERUMBADUR_TN-L&T_DATA_CENTRE-1

Bus 2 Connected Elements
1. 400KV/230KV SRIPERUMBADUR_TN-ICT-3 2. 230KV-NCTPS-SRIPERUMBADUR_TN-1 3. 230KV-KOYAMBEDU-SRIPERUMBADUR_TN-1

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	18.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 58 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

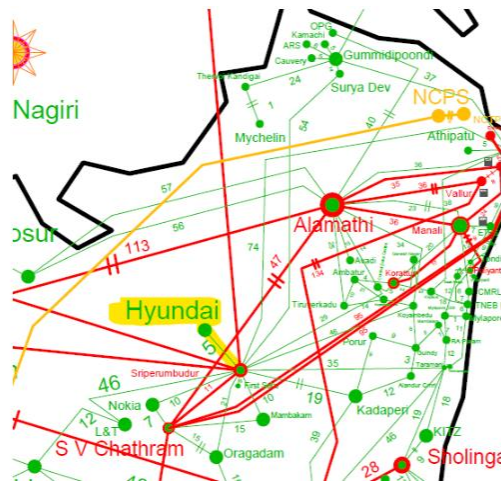
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. SRIPERUMBADUR_TN - 230KV - Bus 1
2. 230KV-HYUNDAI-SRIPERUMBADUR_TN-1
3. 400KV/230KV SRIPERUMBADUR_TN-ICT-1
4. 400KV/230KV SRIPERUMBADUR_TN-ICT-2

5. 400KV/230KV SRIPERUMBADUR_TN-ICT-6
6. 230KV-SRIPERUMBADUR_TN-L&T_DATA_CENTRE-1
7. 230KV-SRIPERUMBADUR_TN-SURYA_DEV-1
8. 230KV-ORAGADAM-SRIPERUMBADUR_TN-1
9. 230KV-SRIPERUMBADUR_TN-THARAMANI-1
10. 230KV-NOKIA-SRIPERUMBADUR_TN-1
11. 230KV-KADAPERI-SRIPERUMBADUR_TN-2
12. 230KV-KADAPERI-SRIPERUMBADUR_TN-1
13. 230KV-SRIPERUMBADUR_TN-KANCHIPURAM-1

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

230kV Hyundai station was radially fed from 230kV Sriperambadur SS through 230KV-HYUNDAI-SRIPERUMBADUR_TN-1 and further as an alternative source a tap option is also available to Hyundai station through 230KV-KOYAMBEDU-SRIPERUMBADUR_TN-1, which is usually in open condition without any breaker mechanism at 230kV Hyundai station (as per the information received by TANTRANSCO). Further, 230 kV Bus-1 and Bus-2 were in service at SRIPERUMBADUR_TN and operating in split bus condition, with the bus coupler in the open condition. The triggering incident is the Y-G fault on the Hyundai line at 10:34:20.080 Hrs and the fault was sensed in Z1 and 3ph tripped (AR is disabled as it is radial feeder). After the fault, jumper between the CT and the circuit breaker snapped towards the CT side and another Y ph fault was created. Since the breaker is in open condition and the due to the fault, and since end fault protection is not enabled, the fault was continued to be being fed during the instance. Due to the 86 initiation, LBB initiation was active and since the fault current was more than the setting, LBB operated in Bus-1 and led to the tripping of all elements connected to 230kV Bus-1 Sriperambadur of TANTRANSCO. 230 kV Bus-2 was in service during the event.



11. DR Analysis:**400KV/230KV SRIPERUMBADUR_TN-ICT-1**

	SRIPERUMBADUR_TN - 400KV
Time Sync Issue	No
DR Analysis	DR Not Submitted

400KV/230KV SRIPERUMBADUR_TN-ICT-2

	SRIPERUMBADUR_TN - 400KV
Time Sync Issue	No
DR Analysis	DR Not Submitted

400KV/230KV SRIPERUMBADUR_TN-ICT-6

	SRIPERUMBADUR_TN - 400KV
Time Sync Issue	No
DR Analysis	DR Not Submitted

SRIPERUMBADUR_TN - 230KV

	SRIPERUMBADUR_TN - 230KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:05-07-2026 10:33:20.116 GND DIST Z2 PKP B, GND DIST Z3 PKP, NTRL DIR OC1 FWD ANY TRIP On (VO23), GND DIST Z1 PKP B, GND DIST Z1 OP B, ANY TRIP On (VO23), TRIP 3-POLE, MCB/TCB-APH. TRIP On (VO11), MCB/TCB-BPH.TRIP On (VO12), MCB/TCB-CPH.TRIP On (VO13)

	LBB B-PH START On (VO73) LBB A-PH START On (VO72), LBB C-PH START On (VO74), LBB 3PH START On (VO75) AR FORCE 3P TRIP H2 MCB/TCB-BPH.OPEN On (CI2), MCB/TCB B-PH OPEN On (VO100) H1 MCB/TCB-APH.OPEN On (CI1), H3 MCB/TCB- CPH.OPEN On (CI3), MCB/TCB A-PH OPEN On (VO99), MCB/TCB C-PH OPEN On (VO101) NEUTRAL TOC1 PKP AR BKR1 BLK NEUTRAL TOC1 PKP LBB A-PH START On (VO72), LBB B-PH START On (VO73), LBB C-PH START On (VO74) MCB/TCB-BPH.TRIP On (VO12) ANY TRIP On (VO23), ANY TRIP On (VO23), BKR FAIL 1 TRIP OP Ir (max): 0.69 kA Iy (max): 31.83 kA Ib (max): 0.54 kA Vr (max): 131.17 kV Vy (max): 131.52 kV Vb (max): 132.52 kV
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230KV-HYUNDAI-SRIPERUMBADUR_TN-1

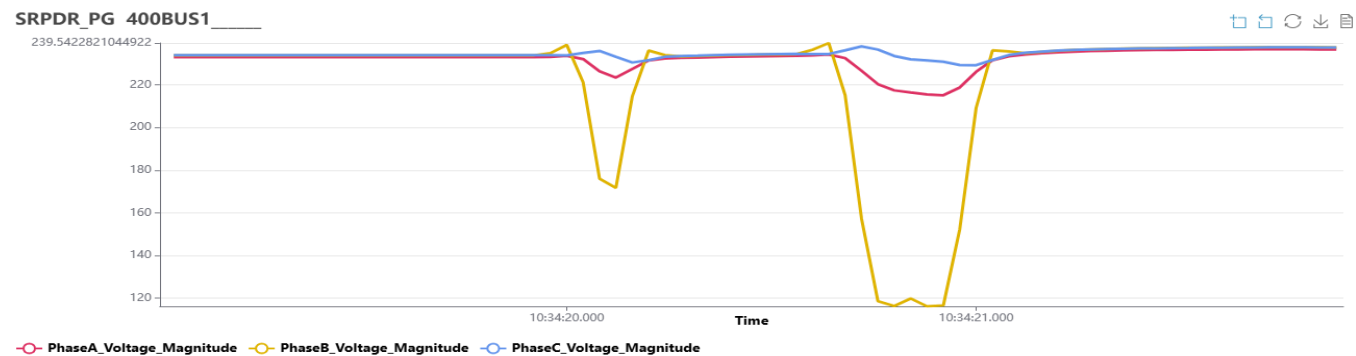
	SRIPERUMBADUR_TN - 230KV	HYUNDAI - 230KV
Time Sync Issue	Yes	Yes
DR Analysis	DR Trigger Time:05-07-2026 10:33:20.116 GND DIST Z2 PKP B, GND DIST Z3 PKP, NTRL DIR OC1 FWD ANY TRIP On (VO23), GND DIST Z1 PKP B, GND DIST Z1 OP B, ANY TRIP On (VO23), TRIP 3- POLE, MCB/TCB-APH. TRIP On (VO11), MCB/TCB-BPH.TRIP On (VO12), MCB/TCB-CPH.TRIP On (VO13) LBB B-PH START On (VO73)	No DR uploaded

	LBB A-PH START On (VO72), LBB C-PH START On (VO74), LBB 3PH START On (VO75) AR FORCE 3P TRIP H2 MCB/TCB-BPH.OPEN On (CI2), MCB/TCB B-PH OPEN On (VO100) H1 MCB/TCB-APH.OPEN On (CI1), H3 MCB/TCB-CPH.OPEN On (CI3), MCB/TCB A-PH OPEN On (VO99), MCB/TCB C-PH OPEN On (VO101) NEUTRAL TOC1 PKP AR BKR1 BLK NEUTRAL TOC1 PKP LBB A-PH START On (VO72), LBB B-PH START On (VO73), LBB C- PH START On (VO74) MCB/TCB-BPH.TRIP On (VO12) ANY TRIP On (VO23), ANY TRIP On (VO23), BKR FAIL 1 TRIP OP Ir (max): 0.69 kA Iy (max): 31.83 kA Ib (max): 0.54 kA Vr (max): 131.17 kV Vy (max): 131.52 kV Vb (max): 132.52 kV	
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HYUNDAI - 230KV

	HYUNDAI - 230KV
Time Sync Issue	No
DR Analysis	Supply Failure

12. A) PMU Analysis:



From the PMU data, a Y-G fault is observed with delayed fault clearance. Subsequently, within the reclaiming time, another Y-G fault is observed.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
TANTRANSCO	1. Non availability of end zone protection needs review 2. Tapping of 230kV HYUNDAI SS at 230kV level needs review 3. Non availability of protection and CB at 230kV HYUNDAI SS needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
TANTRANSCO	Replacement of damaged Jumper & Insulator under progress

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

1. 400/230kV, 500MVA, ICT-1 LV- 11.32hrs
2. 400/230kV, 500MVA, ICT-2 LV-11.33hrs
3. 400/230kV, 500MVA, ICT-6 LV-11.34hrs
4. 230kV Nokia # -11.44hrs
5. 230kV Mambakkam (Sipcot)#-11.45hrs

6. 230kV Taramani#-11.41hrs
7. 230kV Oragadam #-11.39hrs
8. 230kV Kadapperi-2#-11.38hrs
9. 230kV Kadapperi-1#-11.38hrs
10. 230kV Hyundai#- under LC and will be normalized after replaced the damaged jumper
11. 230kV First solar#-11.36hrs
12. 230kV Suryadev#-11.45hrs
13. 230kV L&T#-11.42hrs

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	TANTRANSCO
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TANTRANSCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	TANTRANSCO
4	Any other non-compliance	IEGC section 17.3	TANTRANSCO

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

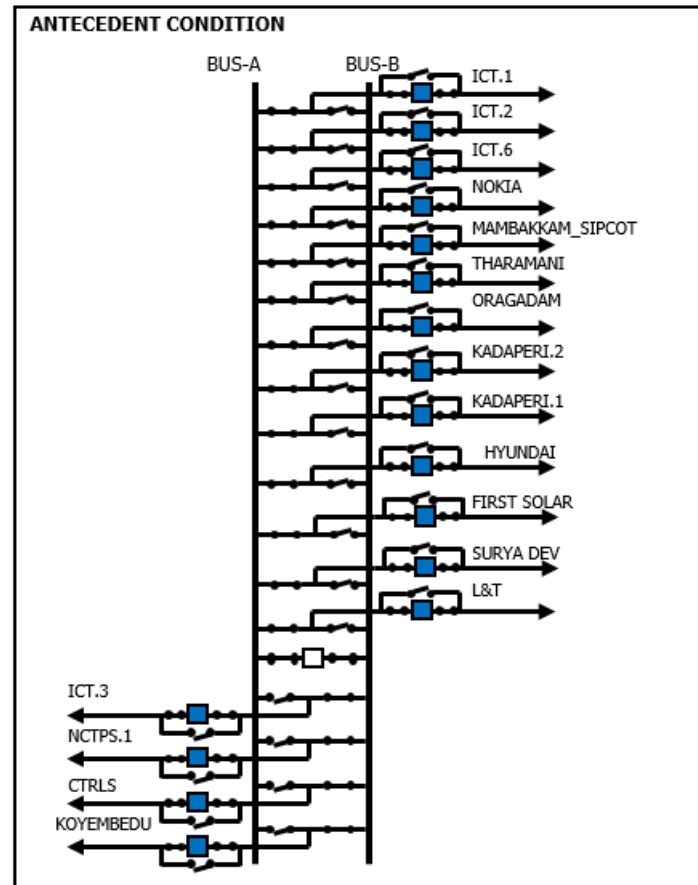
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
05-07-2026 10:34:32	SRIPERUMPUDUR CB 20152 (LINE TO NKIA2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 20852 (LINE-1 TO KDPI2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 21652 (LINE TO SUDV2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 21752 (T6_S) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 20652 (LINE-2 TO KDPI2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 21252 (LOAD FSTS2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 20252 (LINE TO MBKM2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 20552 (LINE TO ORGM2) OPEN	SPDR4_TN
05-07-2026 10:34:32	SRIPERUMPUDUR CB 21152 (LINE TO HYND2) OPEN	SPDR4_TN

Deliberations:

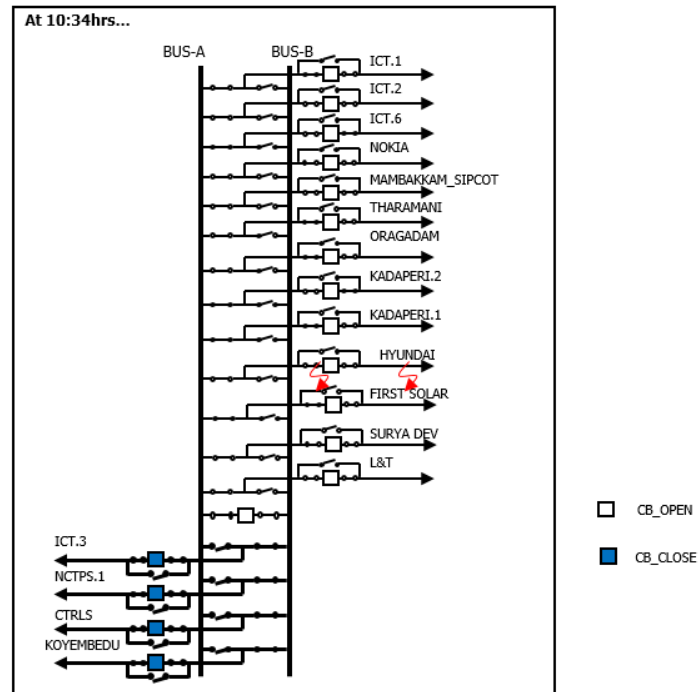
1. TANTRANSCO stated that, under the antecedent conditions, Sriperumbudur 230 kV Substation was operating with a double-bus configuration, with the 230 kV Bus Coupler kept open and split-bus operation maintained.



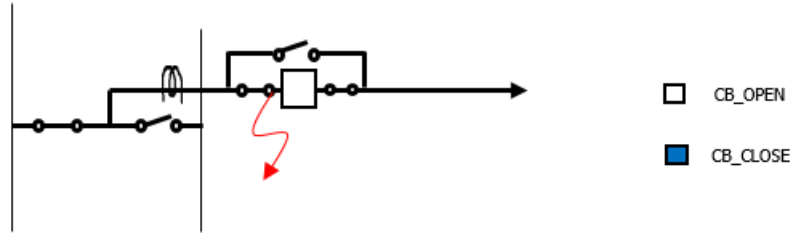
2. TANTRANSCO informed that 13 nos. of 230 kV feeders and 4 nos. of ICTs were connected to the 230 kV buses. The 230 kV Busbar Protection is based on a static high-impedance RADHA relay and, therefore, end-fault protection is not available. The 230 kV Hyundai feeder is a load feeder and hence Auto Reclosure (A/R) was kept out of service.
3. TANTRANSCO stated that, on 05.07.2026 at 10:34 hrs, following a single-line-to-ground fault on the Hyundai feeder, a Y-phase lockout trip was initiated. The 86 relay operated and three-pole tripping occurred. The fault was attributed to a defective polymer insulator at the take-off tower.
4. TANTRANSCO further stated that, subsequently, another fault occurred wherein the jumper was cut and remained hanging between the breaker and the

89C isolator. The hanging jumper subsequently fell onto the structure towards the CT side, resulting in continuous fault current being sensed by the feeder CT until the fault was cleared by the feeder LBB protection.

5. TANTRANSCO stated that LBB initiation was already available through the operation of the 86 relay and, as the fault current exceeded 200 mA for more than 200 ms, the LBB protection operated on 230 kV Bus-A. 230 kV Bus-B remained stable during the incident.

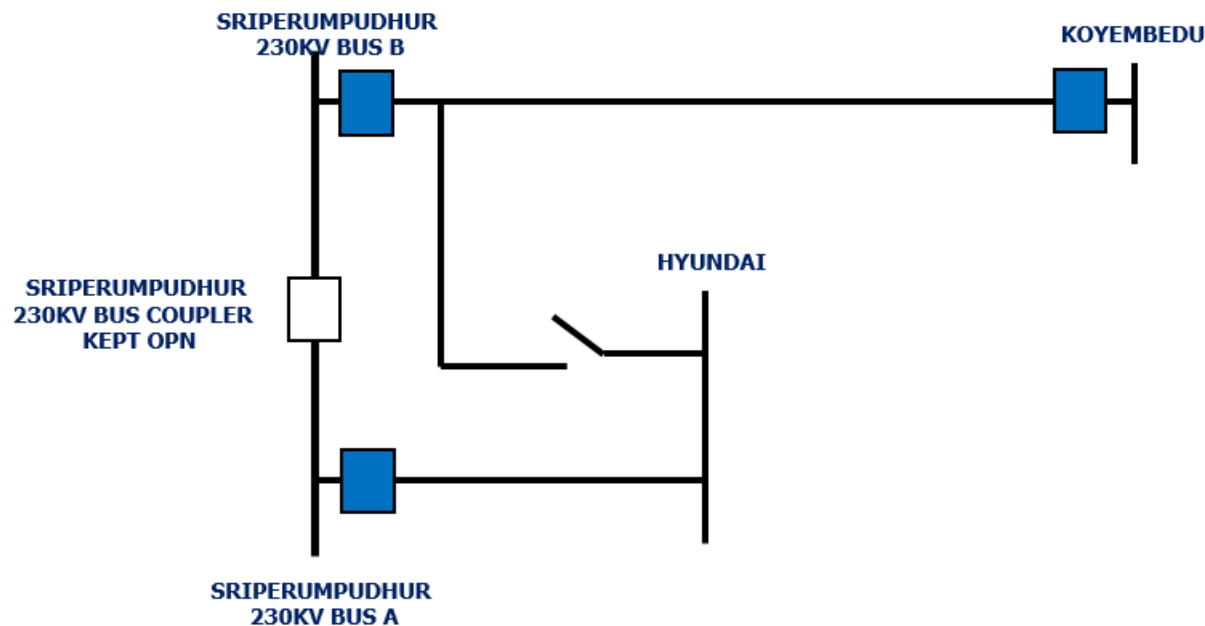


6. TANTRANSCO stated that on detailed analysis they found that Jumper cut & hanged in between feeder 211-89C isolator and feeder breaker Then hanging jumper fell on the structure caused sensing of continuous fault current by the feeder CT until fault is cleared by the feeder LBB protection. All elements connected in Bus A got tripped



7. Remedial Actions Taken:

- Feeder breaker timing test carried out
 - Feeder CB IR value checked when CB is in open condition as well as in closed condition.
 - Defective Y polymer insulator at take off tower attended.
 - Jumper cut in between breaker & 89C isolator attended.
 - Feeder CB LOCAL/REMOTE operation checked and found in order.
8. SRPC enquired about the bus configuration at Hyundai SS. TANTRANSCO stated that Hyundai SS is having 2 sources one is from Sriperumpudhur Bus A as radial feeder (since load). Alternate source is tapped off from 230kV Sriperumpudhur-Koyembedu feeder Which is always open condition



9. SRPC highlighted that the alternate supply from Koyambedu to Hyundai is through a 230 kV tap arrangement and requested TANTRANSCO to rectify the arrangement by providing a suitable LILO arrangement. SRPC further highlighted that the existing 230 kV tap arrangement is not in compliance with the applicable CEA safety regulations.
10. MS, SRPC enquired whether a circuit breaker is available at the Hyundai end. TANTRANSCO stated that Hyundai Substation is an old substation and no circuit breaker arrangement is available at the end. MS, SRPC highlighted that the arrangement is not in compliance with the applicable CEA safety regulations and requested TANTRANSCO to instruct Hyundai to provide an incoming 230 kV circuit breaker at their end. TANTRANSCO stated that they would examine the feasibility of providing a circuit breaker at Hyundai end and update the forum.
11. ED, SRLDC requested TANTRANSCO to provide a definite timeline for completion of the rectification works, considering the non-compliance with the applicable CEA safety regulations.
12. SRPC enquired whether the Re-trip feature is available for LBB operation. TANTRANSCO stated that the LBB scheme is based on a static relay and the Re-trip feature is not available..

Recommendations:

- + **TANTRANSCO to rectify the DR time sync issue at Sriperumbedur SS.**
- + **TANTRANSCO to replace the static BUSBAR relay with numerical relay.**

-  ***TANTRANSCO to replace static LBB relay with numerical and enable the retrip functionality.***
-  ***TANTRANSCO to remove the TAP connection for Hyundai 230kV SS from Koyembedu SS.***
-  ***TANTRANSCO to coordinate with M/s Hyundai and provide Incoming 230kV Circuit breaker for Hyundai SS.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
4	Complete Outage of 400kV Thappukundu SS of TANTRANSCO	400kV Thappukundu SS is connected through 400KV-ANAIKADAVU-THAPPUKUNDU-1&2. The triggering incident is the Y-G fault in of 400 kV Thappukundu–Anaikadavu Line-2 and 400 kV Thappukundu–Anaikadavu Line-1. The tripping of both the lines led to the Complete Outage of 400kV Thappukundu SS of TANTRANSCO	06-07-2026 14:12	111	0	GD - 1	14-07-2026	07-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

400kV Thappukundu SS is connected through 400KV-ANAIKADAVU-THAPPUKUNDU-1&2. The triggering incident is the Y-G fault in of 400 kV Thappukundu–Anaikadavu Line-2 and 400 kV Thappukundu–Anaikadavu Line-1. The tripping of both the lines led to the Complete Outage of 400kV Thappukundu SS of TANTRANSCO

2. Time and Date of the Event (घटना का समय और दिनांक): 06-07-2026 14:12

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): TAMILNADU

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
TamilNadu State Demand (MW)	16300	16466
TamilNadu State Generation (MW)	16732	16709
Grid Frequency (Hz)	50.04	49.99
SR Demand (MW)	51792	51760

SR Generation (MW)	57257	57034
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**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Windy

Bus 1 Connected Elements

1. 400KV-ANAIKADAVU-THAPPUKUNDU-1
2. 400KV/110KV THAPPUKUNDU-ICT-3

Bus 2 Connected Elements

1. 400KV-ANAIKADAVU-THAPPUKUNDU-2
2. 400KV/110KV THAPPUKUNDU-ICT-2
3. 400KV/110KV THAPPUKUNDU-ICT-4

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)		Load Loss (MW)
Solar	21.0 MW	0.0 MW
Wind	90.0 MW	
Others	0.0 MW	
Total	111.0 MW	

7. Duration of interruption (रुकावट की अवधि): 1 hours, 15 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV-ANAIKADAVU-THAPPUKUNDU-1
2. 400KV-ANAIKADAVU-THAPPUKUNDU-2

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

400kV Thappukundu SS is connected through 400KV-ANAIKADAVU-THAPPUKUNDU-1&2.

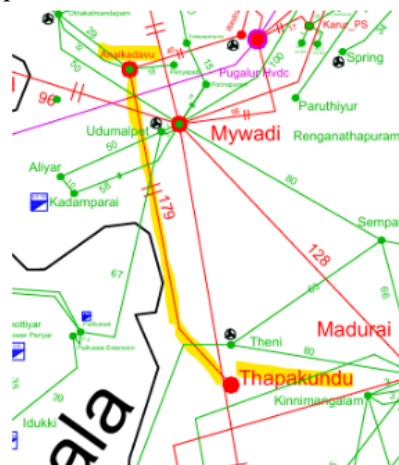
Fault at 13:47 Hrs:

The triggering incident is Y-G high impedance fault in 400kV Thappukundu–Anaikadavu Line-2. At the Anaikadavu end, the fault was sensed in Directional Earth Fault (DEF) protection and 3ph tripped after around 600ms and sent a Direct Trip (DT) signal to the remote end. At the Thappukundu end, the DT signal was received, and the line tripped.

After the tripping of 400kV Thappukundu–Anaikadavu Line-2, 400kV Thappukundu SS was radially connected through 400kV Thappukundu–Anaikadavu Line-1. Also further it was observed that the generation at Thappukundu got reduced during the tripping highlighting the non compliance of LVRT by the RE plants connected to Thappukundu.

Fault at 14:12 Hrs:

The triggering incident is the Y-G fault in 400 kV Thappukundu–Anaikadavu Line-1. At Anaikadavu end, the fault was sensed in Z1 and AR operated and tripped due to persistent fault. At Thappukundu end, the fault was not sensed as there was no fault contribution from Thappukundu.



Tripping of both the lines (400KV-ANAIKADAVU-THAPPUKUNDU-1&2) led to the Complete Outage of 400kV Thappukundu SS @ 06-07-2026 13:47

11. DR Analysis:

400KV-ANAIKADAVU-THAPPUKUNDU-2

	THAPPUKUNDU - 400KV	ANAIKADAVU - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:06-07-2026 13:47:01.989 Any Start, IN>1 Start Z3 DIRECT TRIP 1, DIRECT TRIP 2 TIE CB R PH OPEN MCB R PH OPEN, TIE CB Y PH OPEN MCB Y PH OPEN, TIE CB B PH OPEN MCB B PH OPEN Ir (max): 0.29 kA Iy (max): 2.31 kA Ib (max): 0.46 kA Vr (max): 271.83 kV Vy (max): 240.16 kV Vb (max): 276.79 kV	DR Trigger Time:06-07-2026 13:47:01.988 FD.Pkp TRIP_R_PH, TRIP_Y_PH, TRIP_B_PH, 50/51G1.Op, Trp MAIN_BREAKER_Y_OPEN TIE_BREAKER_B_OPEN TIE_BREAKER_R_OPEN MAIN_BREAKER_B_OPEN, TIE_BREAKER_Y_OPEN MAIN_BREAKER_R_OPEN Ir (max): 0.30 kA Iy (max): 2.11 kA Ib (max): 0.37 kA Vr (max): 0.28 kV Vy (max): 0.24 kV Vb (max): 0.29 kV

400KV-ANAIKADAVU-THAPPUKUNDU-1

	ANAIKADAVU - 400KV	THAPPUKUNDU - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:06-07-2026 14:12:00.983 Any Start DIST Fwd Z3 Any Trip, DIST Trip B, Z1, DIST Sig. Send	DR Trigger Time:06-07-2026 14:12:00.913 Any Start, IN>1 Start CARRIER 1/2 REC CARRIER 1/2 REC V>1 Start V>1 Start

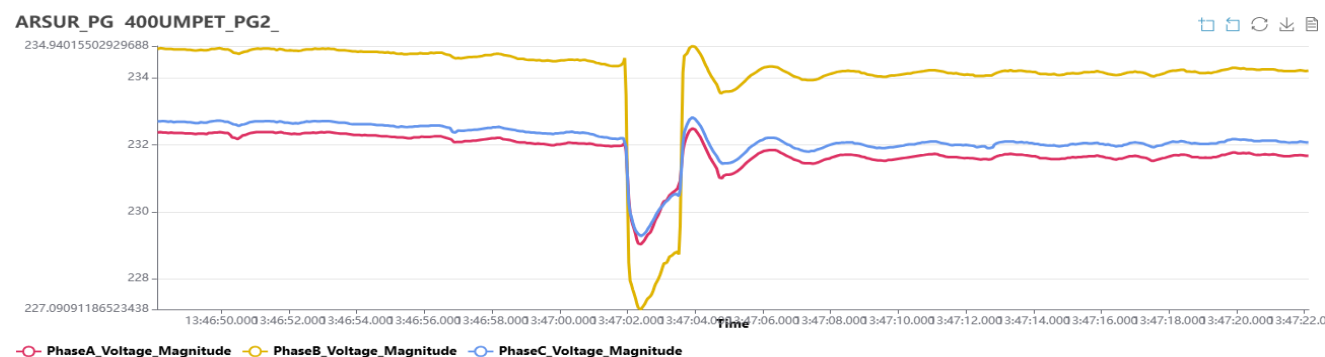
	CB Aux B Any Pole Dead Any Start Any Trip, DIST Fwd, SOTF/TOR Trip Z1, DIST Sig. Send CB Aux B CB Aux A Any Pole Dead, CB Aux C All Pole Dead Ir (max): 0.64 kA Iy (max): 3.11 kA Ib (max): 0.75 kA Vr (max): 268.13 kV Vy (max): 242.38 kV Vb (max): 379.07 kV DR Trigger Time:06-07-2026 14:12:00.910 FD.Pkp Ok_fDiffChk Init_AR&LBB_Y_PH Ok_fDiffChk, Chk_DdB BREAKER_OPEN_Y_PH 79.Inprog Ok_fDiffChk Ok_fDiffChk Ok_fDiffChk AR_CLOSE Chk_DdB Ok_fDiffChk 79.Succ_Rels CB_UNHEALTHY Chk_LvB Init_AR&LBB_R_PH, Init_AR&LBB_Y_PH, Init_AR&LBB_B_PH	Ir (max): 0.66 kA Iy (max): 0.77 kA Ib (max): 0.85 kA Vr (max): 293.69 kV Vy (max): 238.21 kV Vb (max): 325.71 kV
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	79.Fail_Rcls, 79.Fail_Rcls Alm_Device Blk_AR&Init_LBB_3Ph BREAKER_OPEN_Y_PH BREAKER_OPEN_R_PH Ok_fDiffChk, Chk_DdB BREAKER_OPEN_B_PH Ir (max): 0.64 kA Iy (max): 3.06 kA Ib (max): 0.74 kA Vr (max): 0.00 kV Vy (max): 0.00 kV Vb (max): 0.00 kV	
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THAPPUKUNDU - 400KV

	THAPPUKUNDU - 400KV
Time Sync Issue	No
DR Analysis	Loss of power supply

12. A) PMU Analysis:



From the PMU data, Y-G fault is observed with delayed fault clearance.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
TANTRANSCO	1. Non compliance of LVRT by RE plants connected to THAPPUKUNDU during the fault in 400KV-ANAIKADAVU-THAPPUKUNDU-2 at 13:47 Hrs needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
TANTRANSCO	Line test charged & stood OK

15. RLDC Analysis/Observations (Based on Simulation Studies): NA**16. Restoration Details:**

400kVLine.1: 06-072026-15:28

400kVLine.1: 06-072026-16:27

ICT.2 : 06-072026-16:34

ICT.3 : 06-072026-16:35

ICT.4 : 06-072026-16:37

110kV Natrinai : 06-072026-16:39

110kV Regen : 06-072026-16:41

110kV Pavi Green 06-072026-16:43

110kV SR Puram : 06-072026-16:46

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	

2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TANTRANSCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

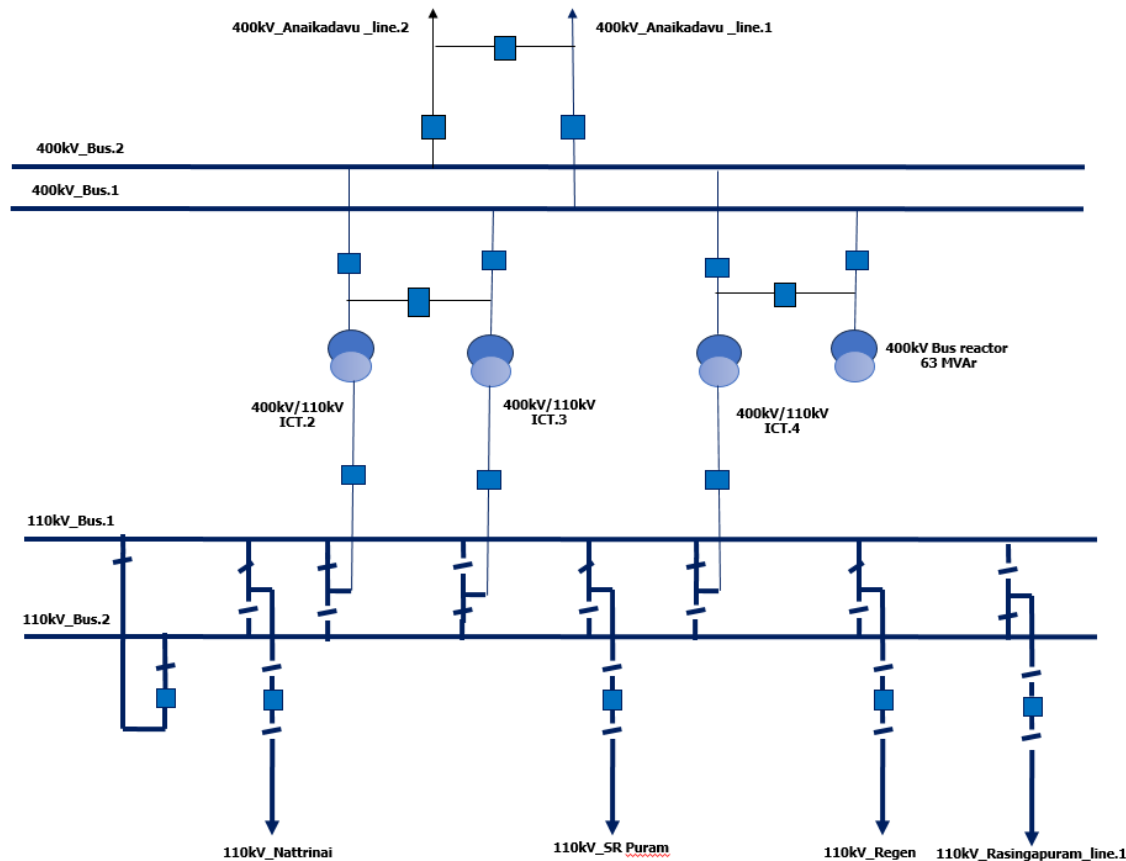
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
06-07-2026 13:47:17	THAPPAKUNDU 400 CB TIE 07 - CB 40752 OPEN	TPGU4_TN
06-07-2026 13:47:17	THAPPAKUNDU 400 CB TIE 08 - CB 40852 OPEN	TPGU4_TN
06-07-2026 13:47:17	ANAIKADAVU400 CB TIE 12 - CB 41252 OPEN	AKDV4_TN
06-07-2026 13:47:17	ANAIKADAVU400 CB TIE 11 - CB 41152 OPEN	AKDV4_TN
06-07-2026 14:12:16	ANAIKADAVU400 CB TIE 10 - CB 41052 OPEN	AKDV4_TN
06-07-2026 14:17:09	THAPPAKUNDU 400 CB 10552 (LOAD LINE2) OPEN	TPGU4_TN
06-07-2026 14:17:29	THAPPAKUNDU 400 CB 10452 (LOAD LINE1) OPEN	TPGU4_TN
06-07-2026 14:18:05	THAPPAKUNDU 400 CB 10952 (LOAD LINE5) OPEN	TPGU4_TN
06-07-2026 14:18:25	THAPPAKUNDU 400 CB 11152 (LOAD LINE7) OPEN	TPGU4_TN

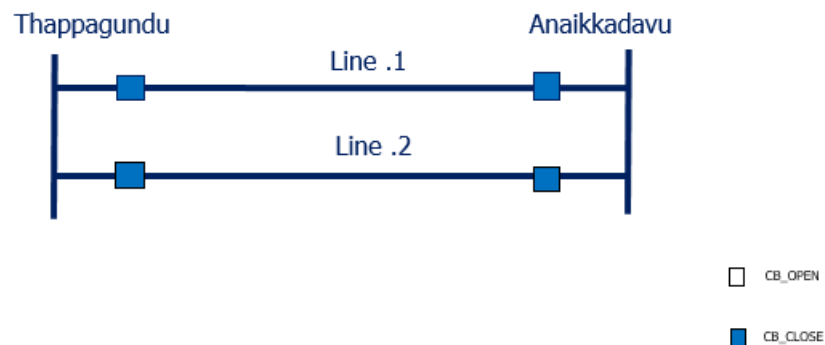
Deliberations:

1. TANTRANSCO stated that Thappagundu 400kVSS is having one and half breaker arrangement with at 400kV side and double bus configuration at 110kV side. There are 2 no of 400kV feeders (400kV Anaikadavu line.1 & 2) 3 no of ICTs (400/110kV) are connected in 400kV Bus.Elements connected in Bus is as depicted.

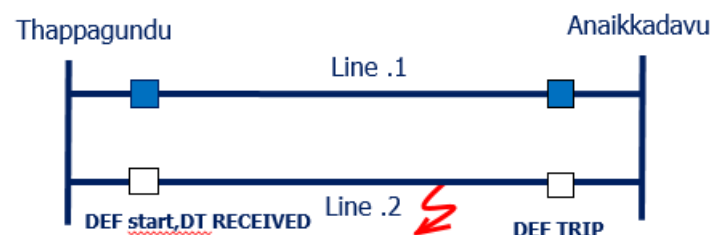


2. TANTRANSCO stated that on 06-07-2026 at 13:47 hrs_ 400kV Thappagundu_ Anaikadavu Line.2 tripped . **At Anikadavu end:** Main-1 and Main-2 relays sensed the high resistance fault & DEF operated.**At Thappagundu end:** Main-1 and Main-2 relays sensed single line to ground fault in Y phase, DEF start observed. After elapse of 1.540 sec, DT received from remote end.**Remedial action:** Fault may be due to heavy wind. Line test charged & stood OK at **06-07-2026 16:27.**

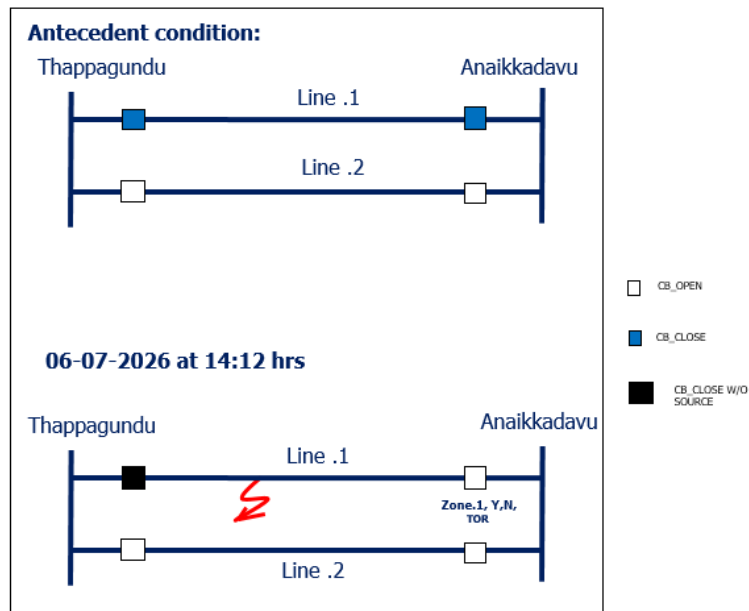
Antecedent condition:



06-07-2026 at 13:47 hrs



3. SRPC enquired about the time duration of DEF operation at Anaikkadavu end. TANTRANSCO stated that it took 1.54 sec from initiation for DEF to operate. SRPC highlighted that SRLDC report is mentioning DEF operation at 600ms and requested SRLDC to revise the report with correct data.
4. TANTRANSCO further informed that 06-07-2026 at 14:12 hrs_ 400kV Thappagundu_ Anaikadavu Line.1 tripped At Anikadavu end, Main-1 and Main-2 relays sensed the single line to ground fault in Y phase, TOR operated Thappagundu end _ holding Due to 3 phase trip at Anaikkadavu end, Source failure at Thappagundu end. Hence, Bus dead
5. **Remedial action:** During the incident heavy wind observed. No line fault were observed . Test charged the line 1 & 2 on 06-07-2026 at 15:27hrs & 16:27 hrs respectively and stood OK.



6. TANTRANSCO informed that a generation loss of 111 MW, comprising 90 MW wind generation and 21 MW solar generation, was observed during the event.
7. MS, SRPC enquired about the Low Voltage Ride Through (LVRT) performance of the RE inverters during the event and the reason for non-compliance. TANTRANSCO stated that, considering the voltage dip observed during the incident, the inverters should have sustained the disturbance. TANTRANSCO informed that the matter has been taken up with the concerned RE generators for compliance with LVRT requirements and that a response is awaited. TANTRANSCO further stated that the matter is being pursued with TNGECL.
8. MS, SRPC enquired about the availability of a PMU at Thappagundu Substation. TANTRANSCO stated that a PMU is presently not available at Thappagundu and informed that the matter would be brought to the notice of the management.
9. SRPC highlighted that, as per the DR at Anaikkadavu end, ANSI 50/51G indication was observed, corresponding to non-directional earth fault/overcurrent protection. SRPC requested TANTRANSCO to review and disable the non-directional earth fault protection for transmission lines, wherever applicable. TANTRANSCO clarified that only directional earth fault protection has been enabled and stated that they would review the DR configuration and rectify any discrepancy.
10. SRPC requested TANTRANSCO to enable mutual compensation for the double-circuit lines, wherever applicable, and review the protection settings accordingly.

Recommendations:

-  *TANTRANSCO to configure the DR as per FOLD committee recommendations at Annaikadavu end.*
-  *TANTRANSCO to enable Mutual compensation for Double circuit lines.*
-  *TANTRANSCO to take up with RE plants for non compliance of LVRT through TNSLDC.*
-  *TANTRANSCO to provide PMU at Thappagundu SS.*

S. No	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
5	Complete Outage 230kV Kilpauk and Athipathu of TANTRANSCO and 230kV NCTPS of TNPGL	230kV NCTPS is evacuating generation through Gummadipoondi and Sriperumbudur lines and other lines were in Radial condition (Kilpauk, NCTPS stage-3, Athipathu -1&2) and 230kV NCTPS-Tondiarpet 1 &2 feeder are under LC. As per the reports submitted, the triggering incident was R-G fault in 230kV NCTPS-Gummidipoondi line and line tripped after which 230kV NCTPS-Sriperumbudur line also tripped on R-G fault. Tripping of both the lines led to the Complete Outage 230kV Kilpauk and Athipathu of TANTRANSCO and 230kV NCTPS of TNPGL	08-07-2026 07:20	395	175	GD - 1	29-07-2026	09-07-2026 22-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

230kV NCTPS is evacuating generation through Gummadipoondi and Sriperumbudur lines and other lines were in Radial condition (Kilpauk, NCTPS stage-3, Athipathu -1&2) and 230kV NCTPS-Tondiarpet 1 &2 feeder are under LC. As per the reports submitted, the triggering incident was R-G fault in 230kV NCTPS-Gummidipoondi line and line tripped after which 230kV NCTPS-Sriperumbudur line also tripped on R-G fault. Tripping of both the lines led to the Complete Outage 230kV Kilpauk and Athipathu of TANTRANSCO and 230kV NCTPS of TNPGL

2. Time and Date of the Event (घटना का समय और दिनांक): 08-07-2026 07:20

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): TAMILNADU

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
TamilNadu State Demand (MW)	18949	18938
TamilNadu State Generation (MW)	10105	10190
Grid Frequency (Hz)	50.02	50.0
SR Demand (MW)	60505	60443
SR Generation (MW)	54193	54244

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At NCTPS Generating Station:

Bus Configuration Type : Single Main and Transfer Bus

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 230KV-NCTPS-NCTPS STG3-1 230KV-NCTPS-KILPAUK-1	230KV-NCTPS-SRIPERUMBADUR_TN-1 230KV-NCTPS-TONDIARPET-1	230KV-NCTPS-TONDIARPET-2 230KV-GUMMIDIPOONDI-NCTPS-1 230KV-NCTPS-ATHIPATU-1 230KV-NCTPS-ATHIPATU-2	

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
395.0 MW	175.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 11 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

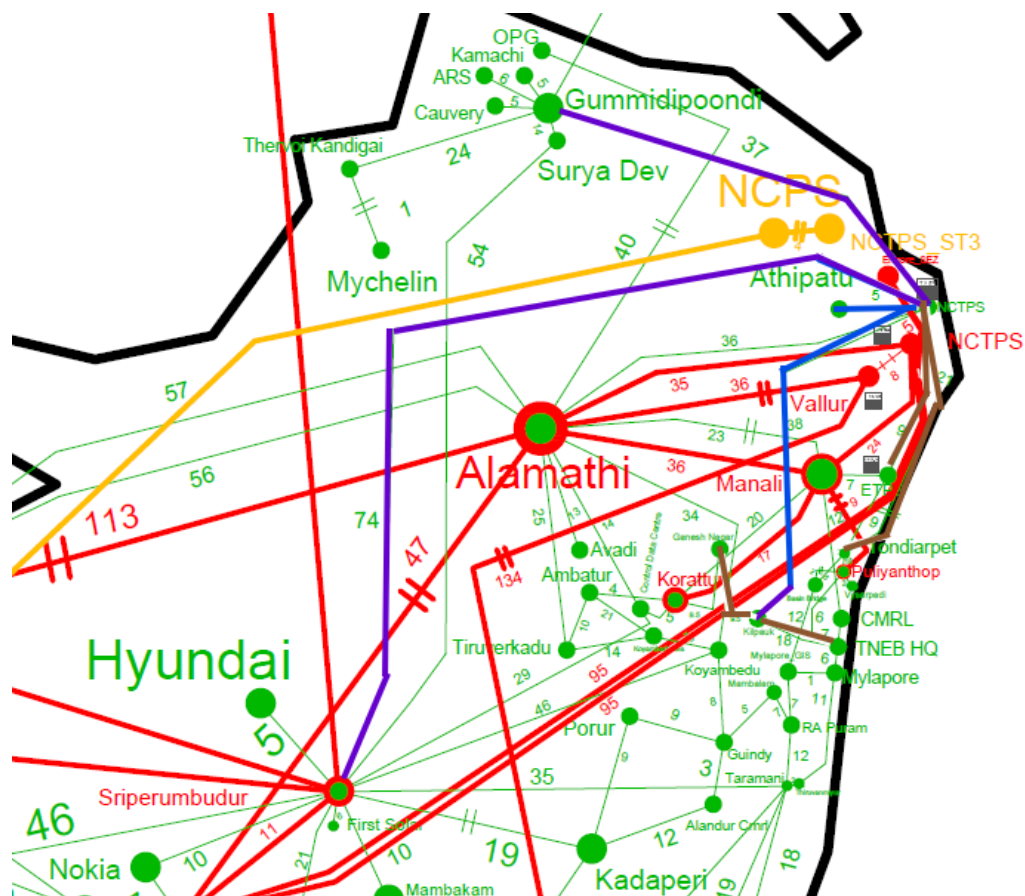
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 230KV-NCTPS-KILPAUK-1
2. 230KV-GUMMIDIPOONDI-NCTPS-1
3. 230KV-NCTPS-SRIPERUMBADUR_TN-1

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

During antecedent conditions, 230kV NCTPS Tondiarpet Line-1 & 2 were under LC and 230kV NCTPS ETPS line was in open condition. 230kV Kilpauk SS and 230kV Athipattu SS are being radially fed from 230kV NCTPS Generating station through 230kV NCTPS Kilpauk and 230kV NCTPS Athipatu feeders and 230kV Kilpauk Ganesh Nagar and 230kV Kilpauk TNEB HQ were in open condition. 230kV Gummidipoondi NCTPS Line and 230KV NCTPS Sriperumbudur are the only feeders through which generation of 230kV NCTPS Generating station is being evacuated to the grid.

As per the reports submitted, at 07:20:34hrs, the triggering incident was R-G fault in 230kV Gummidipoondi NCTPS Line due to failure of R phase wall through bushing at Nctps end. At Gummidipoondi end, the fault was sensed in carrier aided Z2. At NCTPS end, the fault was sensed in Zone-1. At both ends, A/R did not operate and the line tripped. At 07:20:49hrs, in 230KV NCTPS Sriperumbudur feeder, R-G fault was observed due to R phase jumper was cut at location No 36 in the line. At both ends, the fault was sensed zone-1. At Sriperumbudur end, A/R operated and the line was holding. At NCTPS end, A/R did not operate and the line tripped. Tripping of both lines led to loss of evacuation path to 230kV NCTPS leading to complete outage of 230kV NCTPS which inturn led to complete outage of 230kV Kilpauk SS and 230kV Athipathu SS.



11. DR Analysis:

230KV-NCTPS-SRIPERUMBADUR_TN-1

	NCTPS - 230KV	SRIPERUMBADUR_TN - 230KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:08-07-2026 07:20:49.138 START R PH, DIST Start A, Any Start	DR Trigger Time:08-07-2026 07:20:49.160 Started Phase A, Started Phase N L11 CR1 RECVD

	RPh MAIN BKRTRIP, YPh MAIN BKRTRIP, BPh MAIN BKRTRIP, R-TRFR BKR TRIP, Y TRFR BKR TRIP, B TRFR BKR TRIP, 3 PH TRIP, START AR, CARRIER SEND, Any Trip, Fault_REC_TRIG START N CARRIER RECIEVE, DIST. Chan Recv VTS Fast Ir (max): 6.33 kA Iy (max): 1.12 kA Ib (max): 0.55 kA Vr (max): 132.64 kV Vy (max): 147.51 kV Vb (max): 137.95 kV DR Trigger Time:08-07-2026 07:20:49.139 FR_DR TRIG On, GND DIST Z1 OP Ir (max): 6.38 kA Iy (max): 1.14 kA Ib (max): 0.56 kA Vr (max): 141.11 kV Vy (max): 148.02 kV Vb (max): 139.30 kV	Any Trip, Zone 1 Trip, Aid 1 Dist Trip, RL7 FEEDBACK, RL10 CR1 SEND, RL11 CR2 SEND, Aided 1 Receive, Aided 1 Send, Aided 2 Send, Trip Output A L1 CB OPN A Ir (max): 3.06 kA Iy (max): 1.13 kA Ib (max): 0.56 kA Vr (max): 132.74 kV Vy (max): 131.53 kV Vb (max): 131.52 kV
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ATHIPATU - 230KV

	ATHIPATU - 230KV
Time Sync Issue	No
DR Analysis	Loss of power supply

KILPAUK - 230KV

	KILPAUK - 230KV
Time Sync Issue	No
DR Analysis	Loss os power supply

NCTPS - 230KV

	NCTPS - 230KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:08-07-2026 07:20:34.802 Any Start Any Trip, DIST Trip A, DIST Fwd, Z1, R1-MCB R TRIP, R2-MCB Y TRIP, DIST Sig. Send, R3-MCB B TRIP, R4-TCB R TRIP, R5-TCB Y TRIP, R6-TCB B TRIP, R7-Z2-Z3T-EXT AR, R8-START AR, R10-CAR SEND, R11-START R, R14-START N, R15-GEN TRIP, R17-CAR SEND AUX, R18 PO SPARE R14-START N Ir (max): 14.01 kA Iy (max): 1.10 kA Ib (max): 0.54 kA Vr (max): 130.50 kV Vy (max): 129.16 kV Vb (max): 132.23 kV DR Trigger Time:08-07-2026 07:20:49.138 START R PH, DIST Start A, Any Start RPh MAIN BKRTRIP, YPh MAIN BKRTRIP, BPh MAIN BKRTRIP, R-TRFR BKR TRIP, Y TRFR BKR TRIP, B TRFR BKR TRIP, 3 PH TRIP, START AR, CARRIER SEND, Any Trip, Fault_REC_TRIG START N CARRIER RECIEVE, DIST. Chan Recv VTs Fast Ir (max): 6.33 kA Iy (max): 1.12 kA Ib (max): 0.55 kA Vr (max): 132.64 kV Vy (max): 147.51 kV Vb (max): 137.95 kV

	DR Trigger Time:08-07-2026 07:20:34.808 DIST TRIP On, GND DIST Z1 OP PH DIST Z1 OP Ir (max): 13.91 kA Iy (max): 1.10 kA Ib (max): 0.55 kA Vr (max): 130.84 kV Vy (max): 129.47 kV Vb (max): 132.86 kV DR Trigger Time:08-07-2026 07:20:49.139 FR_DR TRIG On, GND DIST Z1 OP Ir (max): 6.38 kA Iy (max): 1.14 kA Ib (max): 0.56 kA Vr (max): 141.11 kV Vy (max): 148.02 kV Vb (max): 139.30 kV DR Trigger Time:08-07-2026 07:21:08.562 81G1 OF TRIP, 81G2 OF TRIP CLASS-C_TRIP GR-1_CL-C_TR Ir (max): 1.31 kA Iy (max): 1.23 kA Ib (max): 1.24 kA Vr (max): 0.27 kV Vy (max): 9.33 kV Vb (max): 9.51 kV DR Trigger Time:08-07-2026 07:20:57.500 81G1 OF START 81G2 OF START 81G1 OF ALARM 81G2 OF TRIP CLASS-C_TRIP GR-1_CL-C_TR LBB_INITATION, GR-1_CL-C_TRP 81G1 OF START, 81G2 OF START 81G2 OF TRIP CLASS-C_TRIP GR-1_CL-C_TR 81G1 OF ALARM Ir (max): 4.20 kA Iy (max): 4.19 kA Ib (max): 4.20 kA Vr (max): 0.40 kV Vy (max): 9.19 kV Vb (max): 9.25 kV DR Trigger Time:08-07-2026 07:20:51.977 46G Alrm
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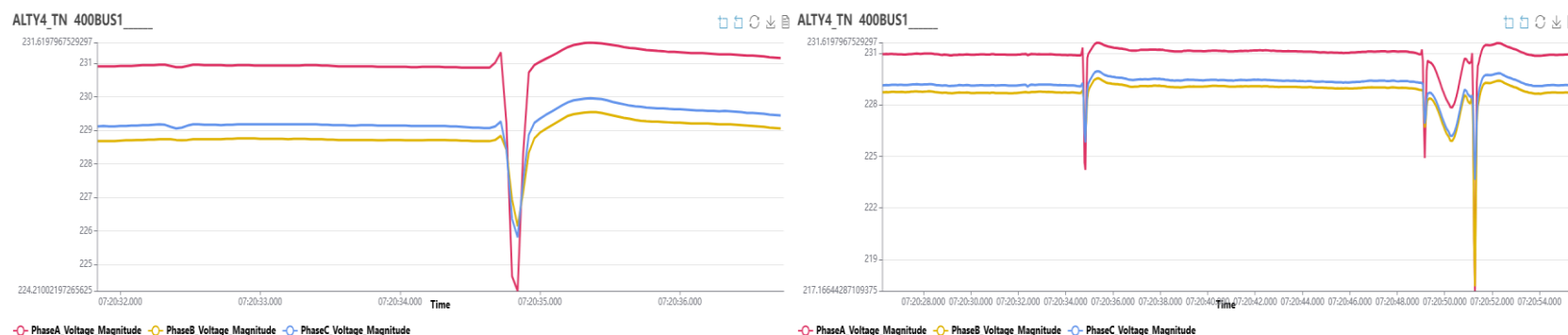
	GT HV OC Strt 27G Strt, Gen OC Strt, GT EF Strt F> Strt F>> Strt F>> Trip Class-C Trip Gr2 CL-C Trip LBB Initiatio Gr2 CL-C Optd GT CB Open F> Optd Ir (max): 15.86 kA Iy (max): 11.80 kA Ib (max): 8.43 kA Vr (max): 9.62 kV Vy (max): 9.67 kV Vb (max): 9.58 kV
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230KV-GUMMIDIPOONDI-NCTPS-1

	GUMMIDIPOONDI - 230KV	NCTPS - 230KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:08-07-0026 07:20:34.811 * *, 50ABC Z4G, MAG4, XAG4 Z2G, MAG2, XAG2, KEY TRP, COMM, A, G, ZONE2, SV3, SV3T, SV9, SV9T, TRIP, IN106, OUT104, OUT101, PTRX, PT, OUT201, OUT204, OUT206, OUT211 79CY RSTMN IN205 SV2	DR Trigger Time:08-07-2026 07:20:34.802 Any Start Any Trip, DIST Trip A, DIST Fwd, Z1, R1-MCB R TRIP, R2-MCB Y TRIP, DIST Sig. Send, R3-MCB B TRIP, R4-TCB R TRIP, R5-TCB Y TRIP, R6-TCB B TRIP, R7-Z2- Z3T-EXT AR, R8-START AR, R10-CAR SEND, R11-START R, R14-START N, R15-GEN TRIP, R17-CAR SEND AUX, R18 PO SPARE R14-START N Ir (max): 14.01 kA Iy (max): 1.10

	SV2T, * 3PO, * SV1, SV1T * * * * * Ir (max): 2.17 kA Iy (max): 0.76 kA Ib (max): 0.32 kA	kA Ib (max): 0.54 kA Vr (max): 130.50 kV Vy (max): 129.16 kV Vb (max): 132.23 kV
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12. A) PMU Analysis:



From the PMU Analysis, R-G fault can be observed during the event without any delayed fault clearance

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
TNPGCL	1. Non operation of A/R at NCTPS end in both 230kV NCTPS Gummidipondi line and 230kV NCTPS Sriperumbudur line.
TANTRANSCO	1. Non operation of A/R at Gummidipoondi end in 230kV NCTPS Gummidipoondi feeder.

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
TNPGCL	The fault trip feeders line fault was attended
TANTRANSCO	Test charged the line & stood OK

15. RLDC Analysis/Observations (Based on Simulation Studies): NA**16. Restoration Details:**

230kv NCTPS-Kilpauk feeder

Normalized on 08.07.2026 at 8.20 Hrs

230kV Station Transformer I Normalized on

08.07.2026. at 08.27 Hrs

230kv NCTPS- Athipattu-II feeder Normalized

on 08.07.202 at 08.36 Hrs

230kv NCTPS-Athipattu-I feeder Normalized

on 08.07.2026 at 08.37 Hrs

230kV Station Transformer II Normalized on

08.07.2026 at 08.44 Hrs

Unit II Synchronized on 08.07.2026 at 08.52Hrs

Unit I Synchronized on 08.07.2026 at 08.54Hrs

230kv NCTPS-Stage III feeder Normalized on

08.07.2026 at 09.16 Hrs

230kv NCTPS-Sriperumbudur feeder

Normalized on 08.07.2026 at 13.40 Hrs

230kv NCTPS-Gummidipoondi feeder

Normalized on 08.07.2026 at 17.42 Hrs

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	TANTRANSCO , TNPGL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TNPGL, TANTRANSCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	TANTRANSCO
4	Any other non-compliance	IEGC section 17.3	TNPGL, TANTRANSCO

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

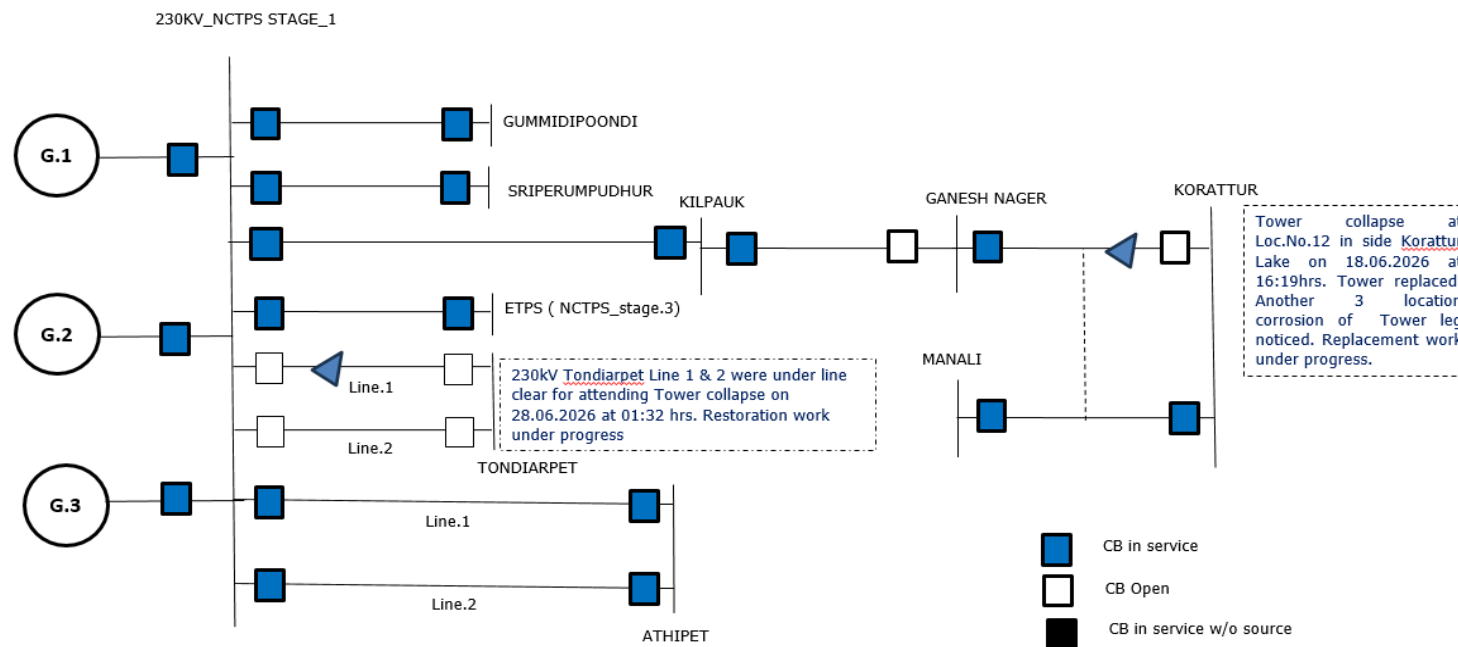
Sequence of Events as per SCADA

time	Event	Location
08-07-2026 07:20:54	KILPAUK CB 20752 (LINE TO NCTP2) OPEN	KLPK2_TN
08-07-2026 07:20:54	NCTPS_S_1_230 CB 21352 (LINE TO GMDI2) OPEN	NCTP2_TG
08-07-2026 07:20:54	GUMMIDIPOONDI CB 20552 (T2_P) OPEN	GMDI2_TN
08-07-2026 07:21:04	NCTPS_S_1_230 CB 21052 (LINE TO SPDR4) OPEN	NCTP2_TG
08-07-2026 07:21:13	NCTPS_S_1_230 CB CB 20852 (GT-2) OPEN	NCTP2_TG
08-07-2026 07:21:13	NCTPS_S_1_230 CB CB 21452 (GT-3) OPEN	NCTP2_TG
08-07-2026 07:21:23	NCTPS_S_1_230 CB CB 20352 (GT-1) OPEN	NCTP2_TG
08-07-2026 07:21:56	NCTPS_S_1_230 CB CB 20352 (GT-1) INVALID	NCTP2_TG

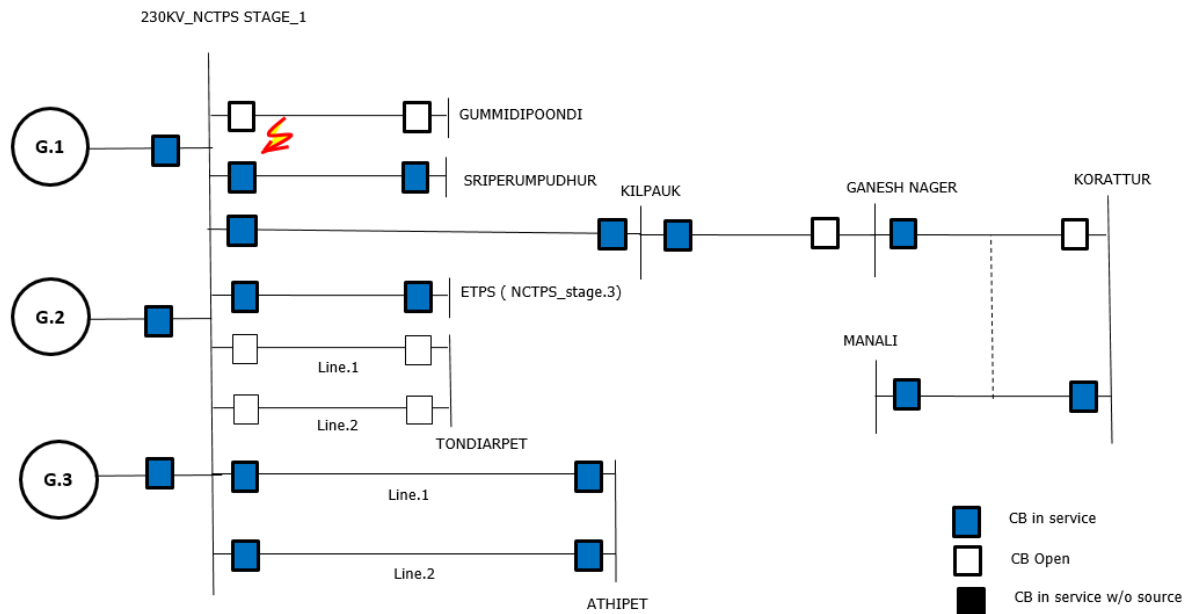
Deliberations:

1. TANTRANSCO stated that during antecedent conditions, 230kV NCTPS Tondiarpet Line-1 & 2 were under LC and 230kV NCTPS ETPS line was in open condition. 230kV Kilpauk SS and 230kV Athipattu SS are being radially fed from 230kV NCTPS Generating station through 230kV NCTPS Kilpauk and 230kV NCTPS Athipattu feeders and 230kV Kilpauk Ganesh Nagar and 230kV Kilpauk TNEB HQ were in open condition. 230kV Gummidipoondi NCTPS Line and 230KV NCTPS Sriperumbudur are the only feeders through which generation of 230kV NCTPS Generating station is being evacuated to the grid.

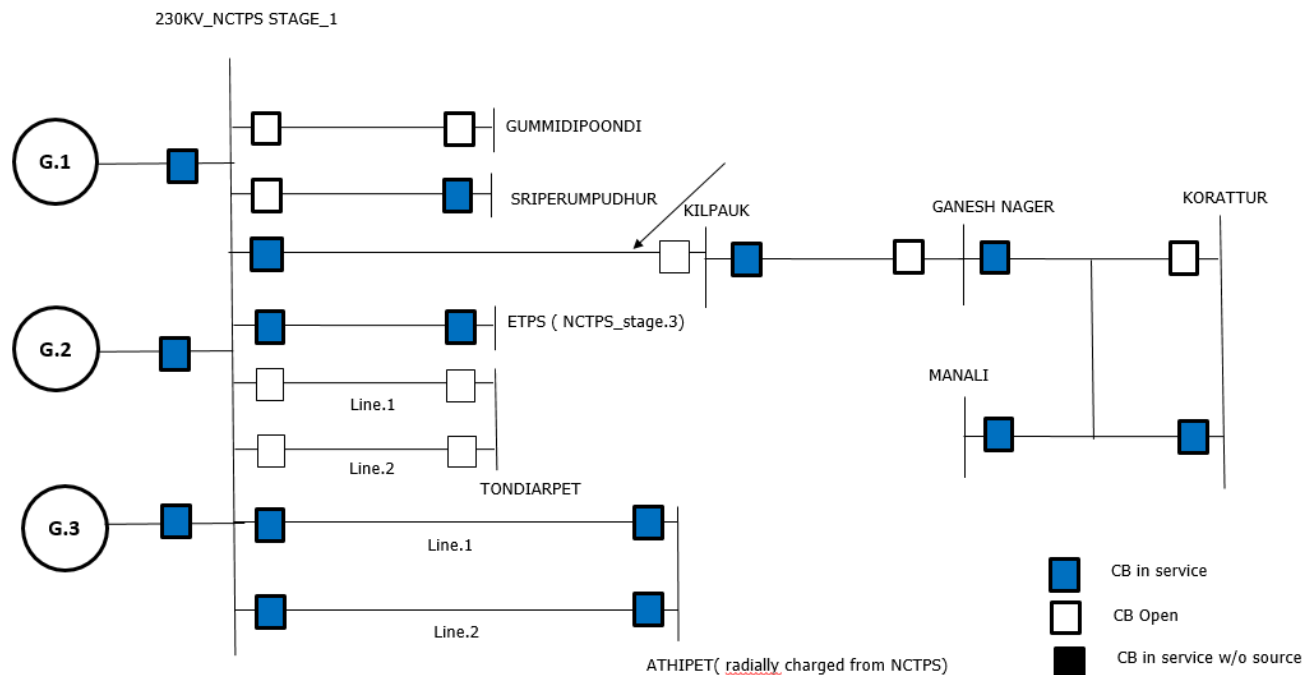
Antecedent Conditions:



2. TANTRANSCO stated that 230KV-GUMMIDIPOONDI-NCTPS-1 tripped at 08-07-2026 07:20:34:53 and restored at 08-07-2026 17:36 _ R phase line cut in between Gantry Tower and wall through Bushing at NCTPS switchyard.

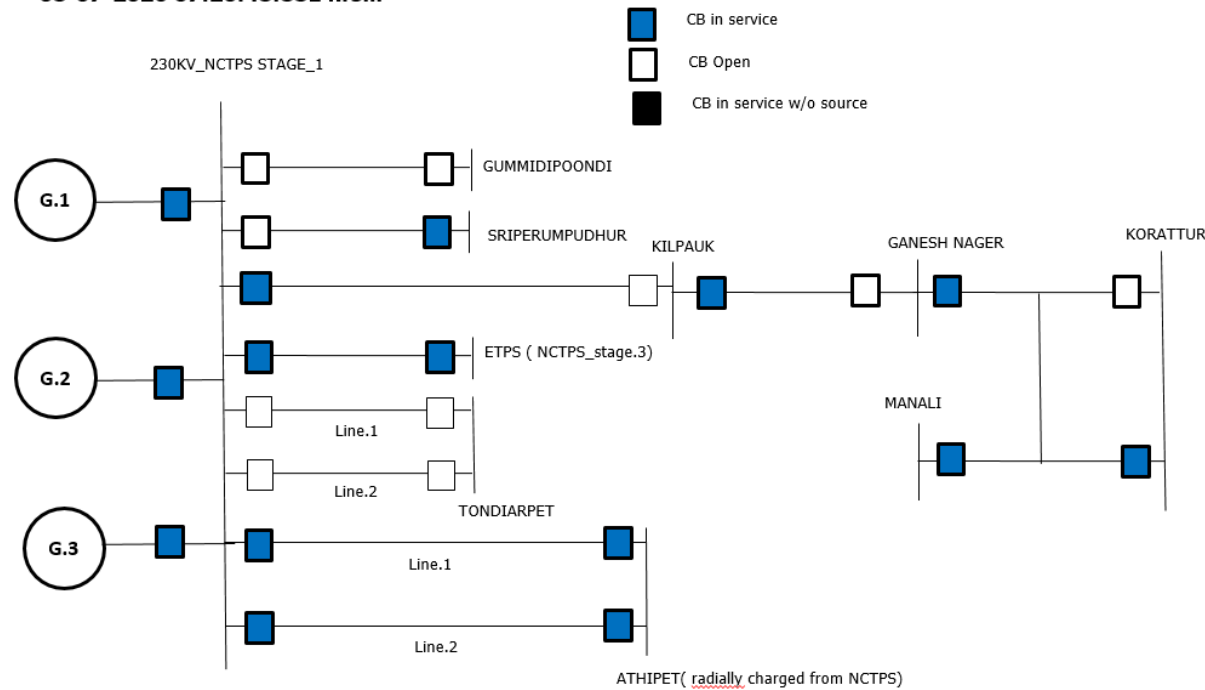


3. TANTRANSCO informed that KILPAUK - 230KV tripped at 08-07-2026 07:20:35:205hrs and restored at 08-07-2026 07:31 via Ganesh Nager source. NCTPS – Kilpauk restored at 08:20 hrs. For the fault in 230kV Gummidippondi feeder, Kilpauk end sensed the fault as R,N,zone.1 & Lockout trip initiated.AR not enabled due to composite feeder.
4. TANTRANSCO stated that on DR Analysis: Since single source, R phase primary voltage was went to 7kV and current was around 500A.Hence Zone.1 operated at Kilpauk end.The phase angle of faulted phase was same as that of Neutral.May be the fault current circulated through neutral of Auto Transformer of Kilpauk **Load Loss:125 MW**

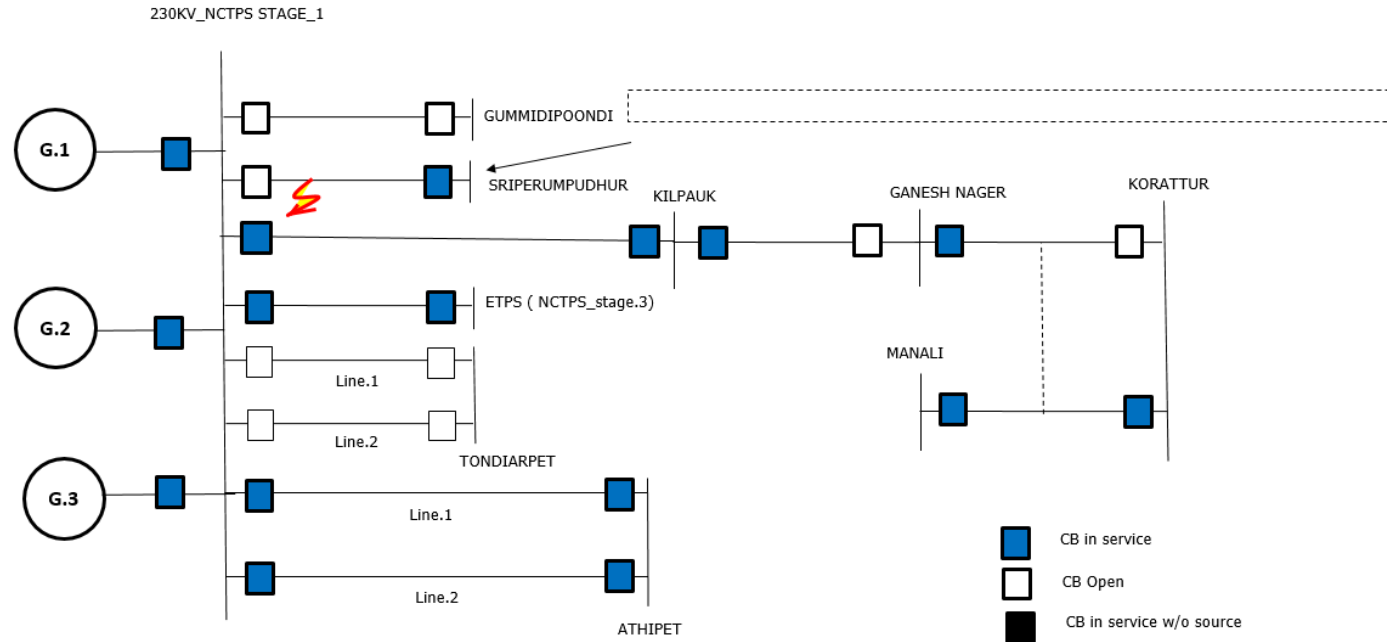


5. Further at 07:20:48:881 110kV Manali – Melur (30MW) feeder (Loc.19 Y phase jumper cut). 07:21:01:798 110kV Athipet- Melur feeder (35 MW) near CPCL Y phase Line cut hence Athipet end over current protection operated. 110kV Melur -sothuperumpedu & Panjetty radial charged condition hence no source condition at Melur 110kVSS. Load Loss: 65 MW.

08-07-2026 07:20:48:881 hrs...

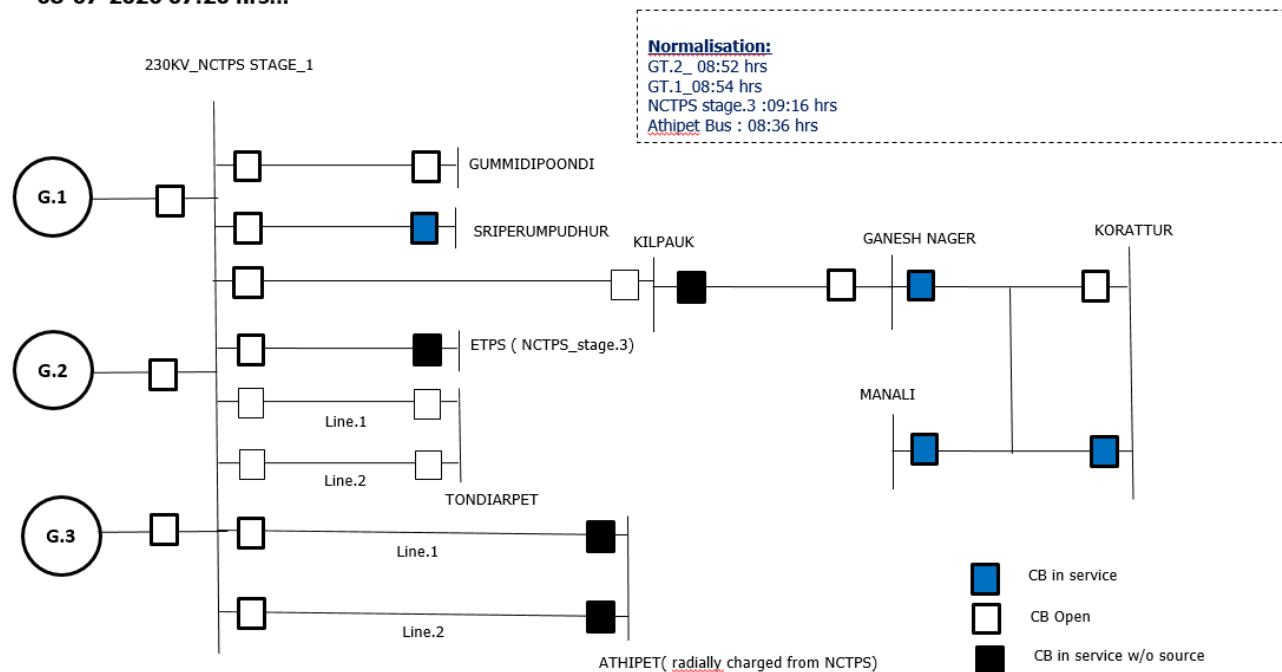


6. After this 230KV-NCTPS-SRIPERUMBADUR_TN-1 tripped at 08-07-2026 07:20:49: and restored at 08-07-2026 13:40 AR found successful at Sriperumpudhur end. R phase jumper was cut at location No 36.



7. TANTRANSCO informed that due to non availability of evacuation path , All three units (Unit -I,II,III) went to House Load of Unit I-12 MW,Unit-2-8MW,Unit-3-12 MW on 08.07.2026@ 07.20 hrs. All Radial feeder were Hand tripped on 08.07.2026 at 07.25 Hrs (Kilpauck feeder,Nctps Stage -3 feeder(07:30) ,Athipatu I (07:26)and Athipatu -II feeder(07:27).

08-07-2026 07:20 hrs...



8. MS, SRPC enquired about the tower failure at Korattur and Tondiarpet end and its restoration status. TANTRANSCO stated that the tower collapse occurred on 28.06.2026 and the restoration work is yet to be completed. MS, SRPC highlighted that Tondiarpet is located in the Chennai city area and that the prolonged restoration of the tower is a matter of concern, as it affects line loading and system reliability.
9. MS, SRPC suggested TANTRANSCO to review the healthiness of transmission towers in the North Chennai area. TANTRANSCO stated that they would discuss the matter with the System Operation wing and update the forum.
10. MS, SRPC enquired about the House Load scheme at NCTPS and the protection through which the generating units went into House Load operation. TANTRANSCO stated that they would verify the details with TNPGL and update the forum. MS, SRPC further requested TANTRANSCO to submit the tower failure report to CEA.
11. SRPC enquired about the non-operation of Auto Reclosure at the NCTPS end for the NCTPS–Sriperumbudur lines. TANTRANSCO stated that NCTPS is equipped with old C&R panels, for which enabling Auto Reclosure is not feasible. TANTRANSCO informed that action has been initiated for replacement of the C&R panels.
12. SRPC highlighted the DR time synchronization issue at Kilpauk end. TANTRANSCO stated that the issue was due to a GPS receiver problem at Kilpauk Substation and informed that the matter has been taken up with the OEM for rectification.

13. SRPC enquired about the Zone-1 operation at Kilpauk Substation during the fault. TANTRANSCO stated that the voltage reduced to approximately 7 kV during the fault, resulting in operation of the distance protection. APTRANSCO observed that, under weak-infeed conditions, Zone-1 operation may not be reliable.
14. SRPC highlighted that the Zone-4 time delay is presently set at 0.8 seconds at the NCTPS, Gummidipoondi and Sriperumbudur Substations, as reflected in DMNS, and requested TANTRANSCO to review and revise the Zone-4 timing settings suitably.

Recommendations:

-  ***TANTRANSCO to submit the tower failure report to CEA.***
-  ***TANTRANSCO to check the healthiness of Towers in North Chennai area and submit a report.***
-  ***TANTRANSCO to rectify the DR time synchronization issues at Kilapauk SS.***
-  ***TANTRANSCO to submit the Houseload operation details at NCTPS station.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
6	Complete Outage of 220kV Hiriya Ostro of RENEW	As per the reports submitted, the triggering incident was Y-G fault in the 220KV-HIRIYUR_OSTRO-HIRIYUR-1 and the line tripped. Tripping of the only connected line led to complete outage of 220KV-HIRIYUR_OSTRO.	08-07-2026 17:00	277	0	GD - 1	16-07-2026	09-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, the triggering incident was Y-G fault in the 220KV-HIRIYUR_OSTRO-HIRIYUR-1 and the line tripped. Tripping of the only connected line led to complete outage of 220KV-HIRIYUR_OSTRO.

2. Time and Date of the Event (घटना का समय और दिनांक): 08-07-2026 17:00

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): KARNATAKA

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Karnataka State Demand (MW)	11330	11202
Karnataka State Generation (MW)	8761	8719
Grid Frequency (Hz)	50.04	50.05
SR Demand (MW)	58628	58054
SR Generation (MW)	52070	51759

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Rainy , Windy

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)		Load Loss (MW)
Solar	0.0 MW	0.0 MW
Wind	277.0 MW	
Others	0.0 MW	
Total	277.0 MW	

7. Duration of interruption (रुकावट की अवधि): 7 hours, 54 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

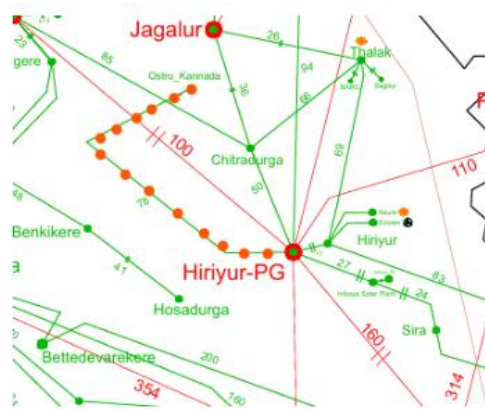
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-HIRIYUR_OSTRO-HIRIYUR-1

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

As per the reports submitted, the triggering incident was Y-G fault in the 220KV-HIRIYUR_OSTRO-HIRIYUR-1 due to Y phase suspension insulator failure at tower no 106. At Hiriyr end, the fault was sensed in Z1 and DT was sent to remote end. A/R did not operate and the line tripped. At Hiriyr_Ostro end, the fault was sensed in carrier aided zone-2, DT was received and the line tripped. Tripping of the only connected line led to complete outage of 220KV-HIRIYUR_OSTRO.

PGCIL SR-2 has reported that Line and Bays @ Hiriyr belongs to Renew Power. 3pole tripping and DT send is enabled in Logic identified and many communications emails sent to Renew Power for approving the logic modifications is still pending from Renew end.



11. DR Analysis:

220KV-HIRIYUR_OSTRO-HIRIYUR-1

	HIRIYUR_OSTRO - 220KV	HIRIYUR - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:08-07-2026 17:00:25.155 EF4PTOC[1]-ST ZMFCPDIS_STFW, ZMFCPDIS_STFW ZMF02-START, ZMF03-START L3CPDIF_STL2, L3CPDIF_BLK2H, L3CPDIF_BLK5H, L3CPDIF_BLKHL2 L3CPDIF_STARTRES L3CPDIF_TRIP, L3CPDIF_TRL2 TRIP1_TRIP, TRIP1 L1, TRIP1 L2, TRIP1 L3, LDLPSCH_TRIP, LDLPSCH_TRL2, BLOCK_AR FAULT_LOOP_Y	DR Trigger Time:08-07-2026 17:00:25.229 DIR_E/F_START, EF4PTOC_STFW L3CPDIF_STL2, L3CPDIF_BLK2H, L3CPDIF_BLK5H M12CRSD M2_TRIP, L3CPDIF_STARTRES M1_TRIP, DT_SEND, LDLPSCH_TRL2, R-PH_TRIP, Y- PH_TRIP, B-PH_TRIP, L3CPDIF_TRL2 FAULT LOOP YPH DT_SEND_CH1 LDCM_DT_RCV

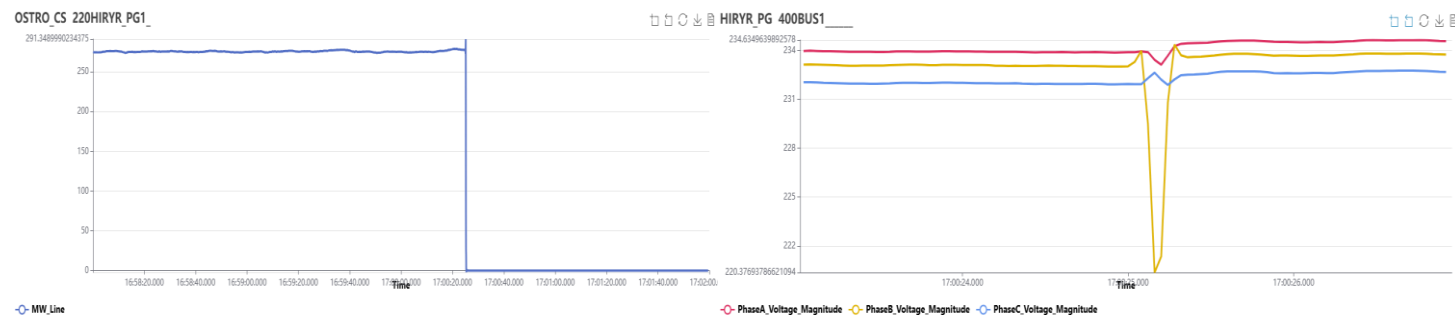
L3CPDIF_STARTUNR REM_INTR RCV LDLPSCH_TRREM 86A/B OPTD DT RCV CH1 PERM1P TR_BCU_M/ MN CB OPEN Y MN CB OPEN R, MN CB OPEN B Ir (max): 0.73 kA Iy (max): 1.02 kA Ib (max): 0.77 kA Vr (max): 134.59 kV Vy (max): 127.06 kV Vb (max): 128.62 kV DR Trigger Time:08-07-2026 17:00:25.157 ZMF03-START, PHS-STFWL2, PHS-STFWPE ZMF02-START, TEF-START CARR RCV CH2 TRIP1_TRIP, TRIP1 L2, ZMF01- TRIP, ZMF01-START, ZCOM_CS, AR START FAULT LOOP Y, CARR RCV CH1 DT RCV CH2, 86A/B OPTD TRIP1 L1, TRIP1 L3 PERM1P TR_BCU_ ZCOM_TRIP Ir (max): 0.73 kA Iy (max): 1.02 kA Ib (max): 0.77 kA Vr (max): 134.53 kV Vy (max): 127.41 kV Vb (max): 128.62 kV	M1/2_CR M2_CAR_RECEIVED PR3P_TRP_MAIN U/V_START T CB_RO T CB_BO T CB_YO M CB_YO M CB_RO M CB_BO Ir (max): 0.72 kA Iy (max): 4.81 kA Ib (max): 0.76 kA Vr (max): 133.79 kV Vy (max): 127.21 kV Vb (max): 127.25 kV DR Trigger Time:08-07-2026 17:00:25.159 PHS-STFWL2, PHS-STNDL2, PHS-STFWPE, PHS-STCNDZ, STNDPE, PHS-STFW1PH, PHS- STPE M2_TRIP, M2Z1_OP, M2Z2_ST, M2Z3_ST, MAIN CB-TRIP, TRP1-TRL2, ZM01-START, ZM01-TRL2, AR01-START, ZM02-STL2, ZM01-STND, ZM02- STND, ZM03-STND, ZMFCPDIS_START, ZMFCPDIS_TRIP, ZMFCPDIS_STTDFWL, TIE CB- TR3P TEF1-START M12CRSD DT SEND CH-2 M1_TRIP, DT_SEND, AR01-
--	--

		INHBIT, MAIN1_TRIP CAR RECV CH-2 M1/2_CR, CAR_AID PREP_3PH_TRIP, MAIN BCU PRE3PH T_CB_RO M_CB_YO T_CB_BO T_CB_YO TBC CB OPEN M_CB_RO, M_CB_BO M_CB_BO, MAIN CB OPEN Ir (max): 0.72 kA Iy (max): 4.81 kA Ib (max): 0.76 kA Vr (max): 133.85 kV Vy (max): 127.24 kV Vb (max): 127.35 kV
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HIRIYUR_OSTRO - 220KV

	HIRIYUR_OSTRO - 220KV
Time Sync Issue	No
DR Analysis	Loss of power supply

12. A) PMU Analysis:



From the PMU Analysis, Y-G fault can be observed during the event without any delayed fault clearance

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
OSTRO_KANNADA	1. Non operation of A/R at both ends. 2. Enabling DT send to Ostro end from Hiriyur end.

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
OSTRO_KANNADA	Line patrolling was conducted, and suspension insulator failure was observed at Tower No. 106. A new insulator was replaced. Post-fault patrolling and inspection of the transmission line and associated PSS/protection system have been completed, and no abnormalities were observed.
PGCIL SR-2	Line and Bays @ Hiriyur belongs to Renew Power. 3pole tripping and DT send is enabled in Logic identified and many communications emails sent to Renew Power for approving the logic modifications is still pending from Renew end.

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details: 09/07/2026 00:54

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	OSTRO_KANN ADA
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	OSTRO_KANN ADA, PGCIL SR-2
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
08-07-2026 17:00:17	OSTRO PS II CB 20552 (LINE TO OSTRO) BETWEEN	OSTR2_CS
08-07-2026 17:00:27	OSTRO PS II CB 30152 (T1_S) OPEN	OSTR2_CS
08-07-2026 17:00:29	HIRIYUR CB TIE 14 - CB 21452 INVALID	HIRYR_PG
08-07-2026 17:00:29	HIRIYUR CB TIE 13 - CB 21352 INVALID	HIRYR_PG
08-07-2026 17:00:39	OSTRO PS II CB 20552 (LINE TO OSTRO) OPEN	OSTR2_CS

Deliberations:

1. M/s Renew stated that the antecedent weather conditions at the time of the incident were rainy with heavy winds. It was further stated that Ostro Kannada Hiriya is connected to Hiriya PG through a single-circuit line.
2. M/s Renew stated that the triggering incident was a Y-G fault on the 220 kV HIRIYUR_OSTRO–HIRIYUR-1 line due to failure of the Y-phase suspension insulator at Tower No. 106. At Hiriya PG end, the fault was sensed in Zone-1, and a Direct Trip (DT) signal was sent to the remote end. Auto-Reclosure (A/R) did not operate, resulting in tripping of the line. At Hiriya_Ostro end, the fault was sensed in carrier-aided Zone-2, and the DT signal was received, resulting in tripping of the line. Since the line was the only source feeding 220 kV HIRIYUR_OSTRO, tripping of the line resulted in a complete outage of 220 kV HIRIYUR_OSTRO.
3. PGCIL SR-II reported that the Hiriya line and bays belong to M/s Renew Power. It was further informed that the three-pole tripping and DT send logic has been identified for modification. PGCIL SR-II stated that several communications have been sent to M/s Renew Power seeking approval for implementation of the proposed logic modifications; however, the approval from M/s Renew Power is still awaited.
4. M/s Renew stated that the matter has been taken up with the OEM, and the OEM is scheduled to visit the site in the upcoming week for necessary inspection and rectification.
5. SRPC highlighted that the relay settings at Hiriya PG end have not been uploaded in the DMNS portal and requested PGCIL to upload/update the latest relay settings in the portal.

Recommendation:

-  ***M/s renew to rectify the DT send logic for Line to ground fault at Hiriya PG end.***
-  ***PGCIL SR-II to upload the relay settings at Hiriya PG in DMNS portal.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
7	Complete Outage of 400kV ATP_RenewVyoman_PSS2 of RENEW	ATP_RenewVyoman_PSS2 is radially connected through 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1. As per the reports submitted, the triggering incident is the over voltage protection operation in 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1 at ATP_RenewVyoman_PSS2 end and DT was sent to remote end. Tripping of the only line led to the Complete Outage of 400kV ATP_RenewVyoman_PSS2 of RENEW	17-07-2026 17:46	0	0	GD - 1	06-08-2026	-	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

400kV ATP_RenewVyoman_PSS2 is radially connected through 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1. As per the reports submitted, the triggering incident is the over voltage protection operation in 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1 at ATP_RenewVyoman and DT was sent to remote end. Tripping of the only line led to the Complete Outage of 400kV ATP_RenewVyoman_PSS2 of RENEW

2. Time and Date of the Event (घटना का समय और दिनांक): 17-07-2026 17:46

3. Event Category (ग्रिड घटना का प्रकार): GD - 1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): ANDHRA PRADESH

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Andhra Pradesh State Demand (MW)	10700	10708

Andhra Pradesh State Generation (MW)	7944	8004
Grid Frequency (Hz)	50.01	50.01
SR Demand (MW)	60408	60052
SR Generation (MW)	56554	56385

**Pre and post data of 1 minute before and after the event*

Elements under outage	1. 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1 2. 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1 3. 400KV/33KV ATP_RenewVyoman_PSS2-ICT-1
Weather Condition (मौसम स्थिति)	Normal

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

7. Duration of interruption (रुकावट की अवधि): 2 hours, 0 minutes

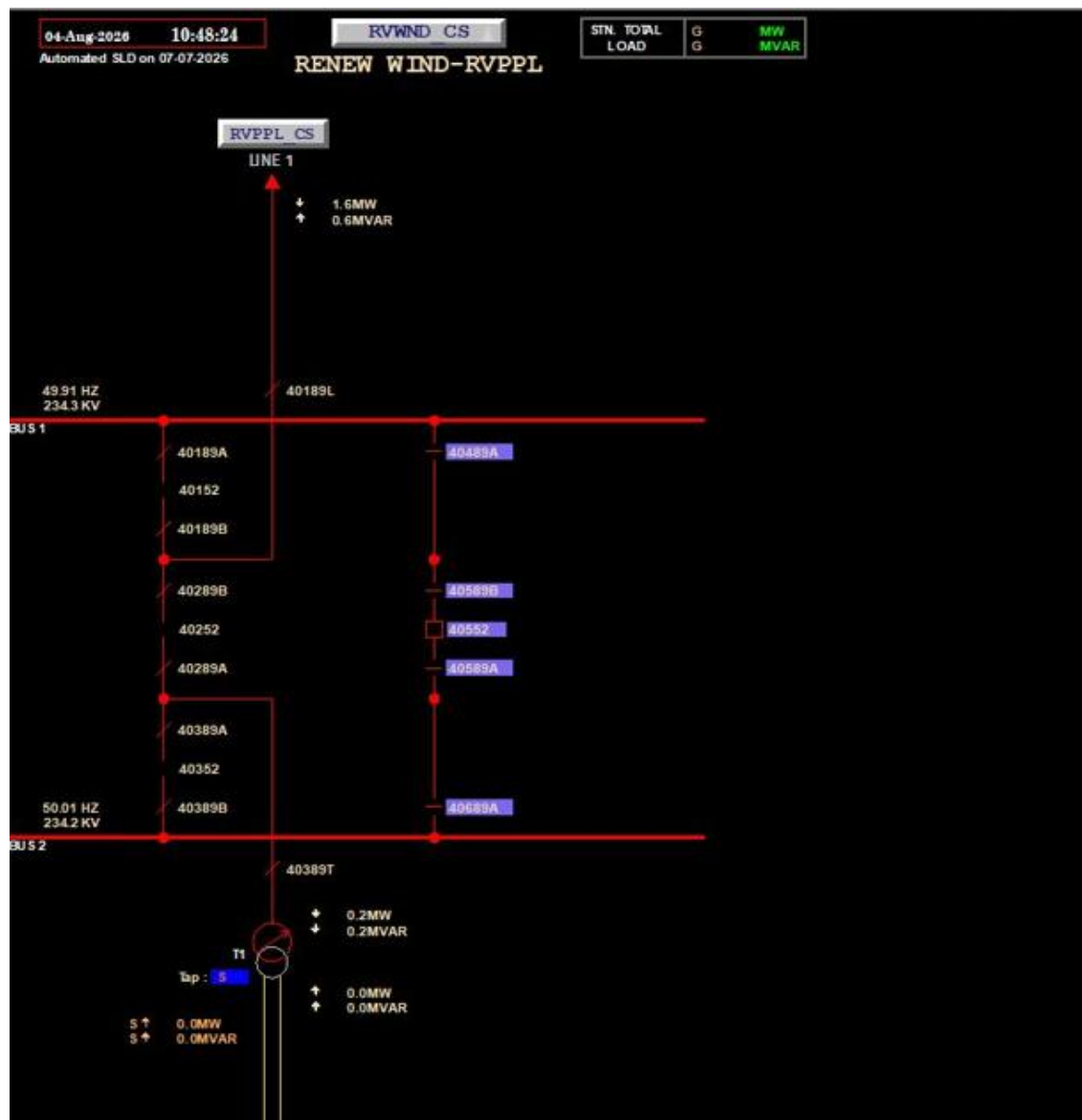
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

400kV ATP_RenewVyoman_PSS2 is radially connected through 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1. As per the reports submitted, the triggering incident is the over voltage protection operation in 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1 at ATP_RenewVyoman and DT was sent to remote end. However, the Over voltage tripping is not as per grading as verified from the PMU as voltages are 103%(Vr-237kV, Vy-238kV, Vb-236kV) during antecedent conditions. Tripping of the only line led to the Complete Outage of 400kV ATP_RenewVyoman_PSS2 of RENEW.



11. DR Analysis:

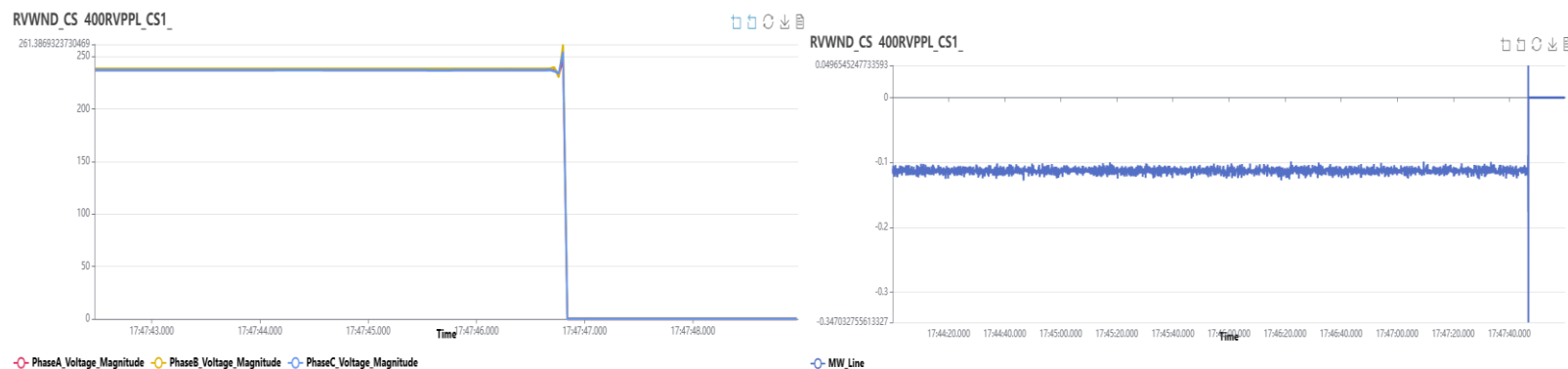
400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1

	ATP_RenewVyoman_PSS2 - 400KV	ATP_RenewVyoman - 400KV
Time Sync Issue	No	No
DR Analysis	DR is not furnished	DR Trigger Time:17-07-2026 17:47:46.845 L19 CB B-PH OPEN L17 CB R-PH OPEN, L18 CB Y-PH OPEN V>1 Start A/AB L4 DT REC CH-1, L4 DT REC CH-1 L11 DT REC CH-2 L1 86A OPTD Ir (max): 0.02 kA Iy (max): 0.03 kA Ib (max): 0.03 kA Vr (max): 303.95 kV Vy (max): 271.48 kV Vb (max): 268.32 kV

ATP_RenewVyoman_PSS2 - 400KV

	ATP_RenewVyoman_PSS2 - 400KV
Time Sync Issue	No
DR Analysis	Loss of power supply

12. A) PMU Analysis:



From the PMU data, tripping of the line can be observed with voltages Vr-237kV, Vy-238kV, Vb-236kV during antecedent conditions.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
RENEW POWER PVT LTD	1. Tripping of 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1 with 103% of voltage on over voltage grading needs review. 2. Non furnishing of DR at ATP_RenewVyoman_PSS2 end in 400KV-ATP_RenewVyoman-ATP_RenewVyoman_PSS2-1

14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

Complete Outage of 400kV ATP_RenewVyoman_PSS2 of RENEW

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities

1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	RENEW POWER PVT LTD
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	RENEW POWER PVT LTD
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	RENEW POWER PVT LTD
4	Any other non-compliance	IEGC section 17.3	RENEW POWER PVT LTD

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
17-07-2026 17:47:48	RENEW WIND-RVPPL CB TIE 01 - CB 40152 OPEN	RVWND_CS
17-07-2026 17:47:48	RENEW WIND-RVPPL CB TIE 02 - CB 40252 OPEN	RVWND_CS
17-07-2026 17:47:51	RENEW VYOMAN CB 40352 (LINE-1 TO RVWND) OPEN	RVPPL_CS

Deliberations:

1. M/s Renew stated that the 400 kV ATP_RenewVyoman–ATP_RenewVyoman_PSS2-1 line is the only circuit connecting 400 kV ATP_RenewVyoman_PSS2 in a radial configuration.
2. M/s Renew stated that on 17.07.2026 at 17:46 Hrs, the Over Voltage (OVR) protection operated on the 400 kV ATP_RenewVyoman–ATP_RenewVyoman_PSS2-1 line at ATP_RenewVyoman end, and a Direct Trip (DT) signal was sent to the remote end. Tripping of the only connected line resulted in the complete outage of 400 kV ATP_RenewVyoman_PSS2 of M/s Renew.
3. SRLDC stated that the OVR operation was not in accordance with the recommended grading. As verified from the PMU data, the voltages during the antecedent condition were around 103% ($V_r = 237$ kV, $V_y = 238$ kV and $V_b = 236$ kV), which does not warrant operation of the OVR protection.
4. SRPC enquired whether the OVR grading had been implemented in the relay as per the settings recommended by SRPC. SRLDC confirmed that the settings adopted in the relay are as per the SRPC-approved grading. However, it was observed that the OVR element has been configured for instantaneous tripping upon pickup, without the required time delay, which is resulting in unwanted tripping of the line.
5. M/s Renew stated that, as observed from the Digital Recorder (DR) data, the secondary voltage reached approximately 110% during the event. SRPC enquired whether any testing or commissioning activity was being carried out at the station during the incident period. M/s Renew confirmed that no testing activity was being carried out during the incident.
6. PGCIL SR-II suggested that M/s Renew verify the CVT secondary circuit earthing, as double earthing of the CVT secondary circuit at the station may result in abnormal/increased secondary voltage indications and could lead to erroneous operation of the OVR protection.

Recommendations:

 ***M/s Renew to identify the reason for OVR in consultation with relay OEM and submit detailed report to SRPC & SRLDC.***

II. Details of Grid Incidents

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
1	Tripping of 220kV Bus-2 of 220kV Gooty SWS of APTRANSCO	220kV Gooty SWS is operating with double bus with bus coupler configuration. As per the reports submitted, the triggering incident was R-G fault in 220kV Gooty Bus-2. Immediately, 220kV Bus-2 BBP operated and all elements connected to the bus tripped leading to loss of power supply to 220kV Bus-2 of 220kV Gooty SWS	22-05-2026 07:38	0	0	GI-1	05-06-2026	29-05-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV Gooty SWS is operating with double bus with bus coupler configuration. As per the reports submitted, the triggering incident was R-G fault in 220kV Gooty Bus-2. Immediately, 220kV Bus-2 BBP operated and all elements connected to the bus tripped leading to loss of power supply to 220kV Bus-2 of 220kV Gooty SWS

2. Time and Date of the Event (घटना का समय और दिनांक): 22-05-2026 07:38

3. Event Category (ग्रिड घटना का प्रकार): GI-1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): ANDHRA PRADESH

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Andhra Pradesh State Demand (MW)	9453	9451
Andhra Pradesh State Generation (MW)	6761	6766
Grid Frequency (Hz)	49.98	50.04

SR Demand (MW)	51184	51305
SR Generation (MW)	49686	49700

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

7. Duration of interruption (रुकावट की अवधि): 4 hours, 5 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

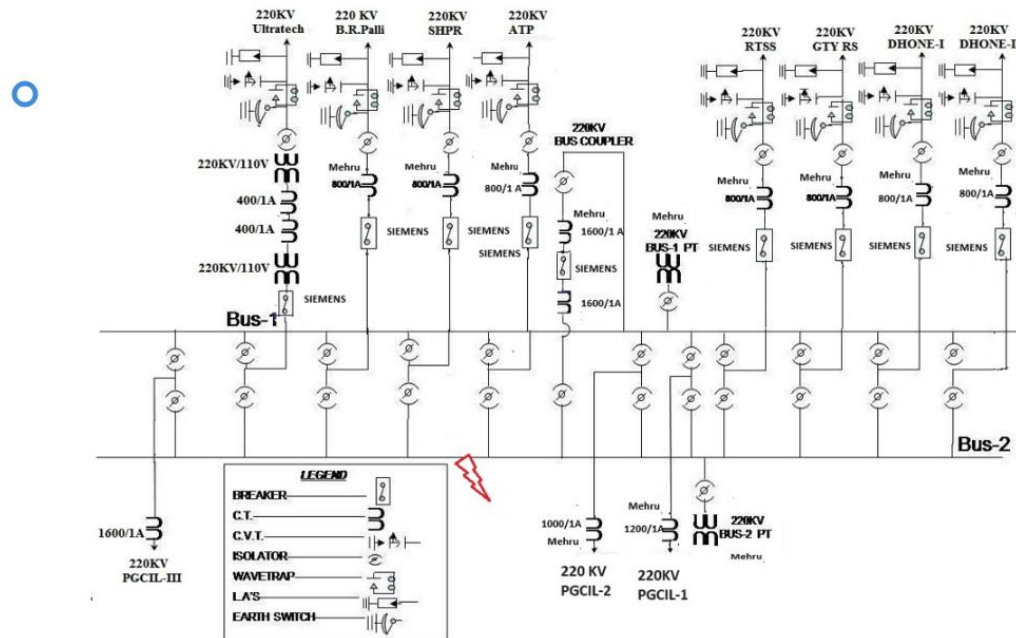
1. GOOTY-SWS - 220KV - Bus 2
2. 220KV-GOOTY-SWS-DHONE-2
3. 220KV-GOOTY-SWS-GOOTY-RLY-1
4. 400KV/220KV GOOTY-ICT-1
5. 400KV/220KV GOOTY-ICT-2
6. 220KV-GOOTY-SWS-SHAPURAM-1
7. 220KV-GOOTY-SWS-BOYAREDDYPALLI-1
8. 220KV-GOOTY-SWS-ULTRATECH-1

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

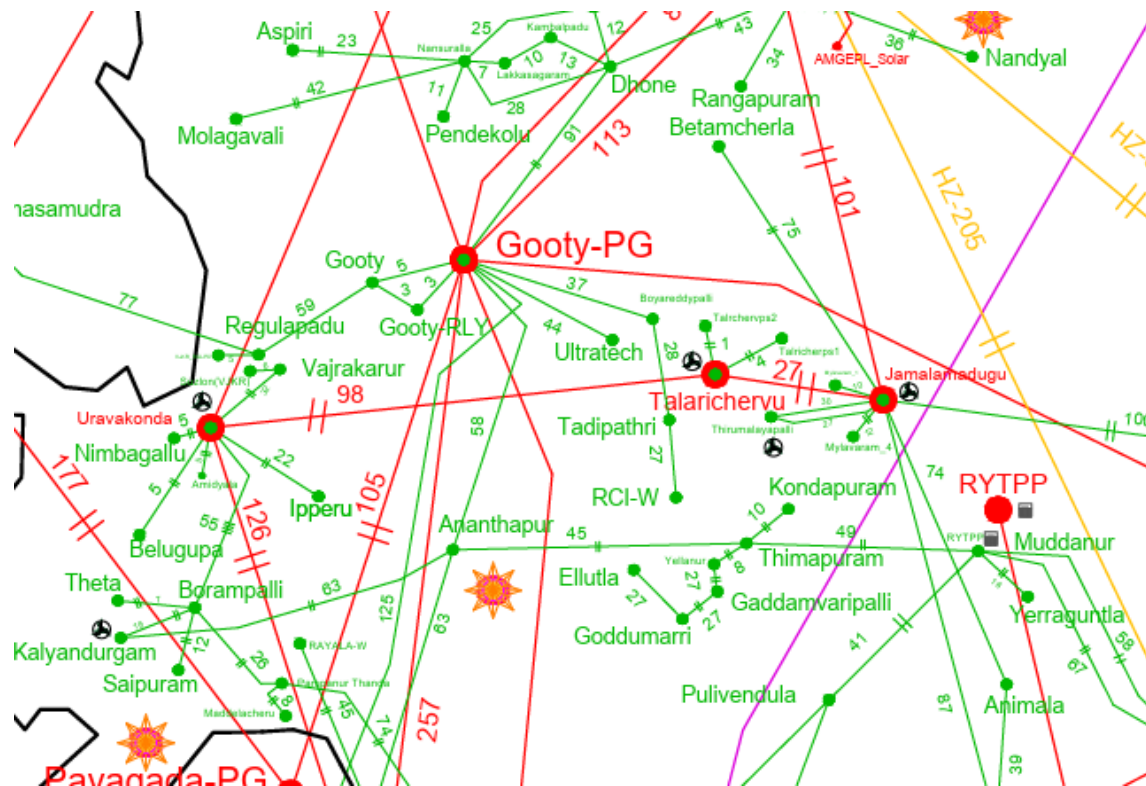
220kV Gooty SWS is operating with double bus with bus coupler configuration. As per the reports submitted, the triggering incident was R-G fault in 220kV Gooty Bus-2 due to flashover of the disc insulator string of the R-phase conductor of 220 kV bus-2 section between 220 kV Shapuram line and 220 kV Boyareddy

palli line as shown in the diagram below.

SINGLE LINE DIAGRAM OF 220KV SWITCHING STATION, GOOTY DOC : 08-07-1991



Immediately, 220kV Bus-2 BBP operated and trip signal was extended to all the elements connected to 220kV Bus-2. However, B-phase limb of 220kV Gooty SwS Dhone Line-2, Y-phase limb of 220kV Gooty SwS Boyareddypalli line failed to open at Gooty end due to failure of TC-1 and TC-2 trip contacts of the 96 trip relays. After around 700ms, the faulty section of 220 kV Bus-2 R-phase has fallen on the ground as well as on the bus jumpers of the 220 kV Shapuram line resulting in grounding of all three phases of 220 kV Bus-2 causing RYBG fault in 220kV Bus-2. During this fault LBB initiated in 220kV Gooty Dhone Line-2 and 220kV Gooty Boyareddypalli lines and LBB operated again in 220kV Bus-2. However DT was not extended to remote ends of these lines. This fault was sensed in zone-2 in the remote ends of 220kV Gooty Dhone Line-2 and 220kV Gooty Boyareddypalli lines. This led to loss of power supply to 220kV Bus-2 odf 220kV Gooty SwS.



11. DR Analysis:

400KV/220KV GOOTY-ICT-1

	GOOTY - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:22-05-2026 07:38:31.028 IV_M_CB_OPEN Ir (max): 0.25 kA Iy (max): 0.26 kA Ib (max): 2.37 kA

400KV/220KV GOOTY-ICT-2

	GOOTY - 400KV
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Time Sync Issue	No
DR Analysis	DR Trigger Time:22-05-2026 07:38:31.039 IV_M_CB_OPEN Ir (max): 0.16 kA Iy (max): 0.15 kA Ib (max): 2.57 kA

GOOTY-SWS - 220KV

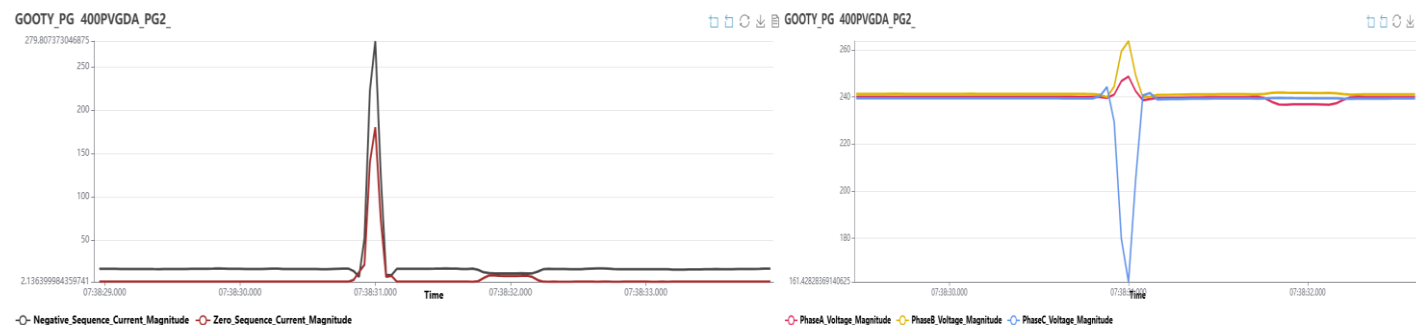
	GOOTY-SWS - 220KV
Time Sync Issue	Yes
DR Analysis	B-Ph BBP relay at Gooty: DR Trigger Time:22-05-2026 07:32:43.946 ZB COMMON TR, CHECK ZONE TR B2 BRP LBBINI, B3 BC LBBINI, B5 DN2 LBBINI, B6 ULT LBBINI, B7 SHP LBBINI, B8 RTSSLBBINI B2 BRPL TR, B3A BC B1 TR, B5 DHN2 TR, B6 ULTC TR, B7 SHP TR, B8 RTSS TR, B10 PG1 TR, B11 PG2 TR B2 BRP RETRIP B2 BRP LBB TR ZB EXT BAY TR Ir (max): 0.66 kA Iy (max): 1.57 kA Ib (max): 0.27 kA BR Palli end DR on Gooty feederDR Trigger Time:22-05-2026 07:38:30.962 21_STFWL1, 21_STFWPE 67N_START 21_STZ4 67N_START 21_STFWL3, 21_STFWPE 21_STZ2, 21_STZ3, 21_STZ4 21_TRZ2, COMMON_TRIP, R-PH_TRIP, Y-PH_TRIP, B-PH_TRIP, 3-PH_TRIP, QA1_INHIBIT_AR 21_BPH_FAULT

	AR_PREP3P 86A/B OPTD 3PH TRIP M2 CB_R-PH_OPEN, CB_B-PH_OPEN CB_Y-PH_OPEN Ir (max): 0.69 kA Iy (max): 0.38 kA Ib (max): 1.52 kA Vr (max): 136.70 kV Vy (max): 138.87 kV Vb (max): 156.44 kV Busbar R-phase unit:DR Trigger Time:22-05-2026 07:31:05.914 ZB COMMON TR, CHECK ZONE TR ZA IIN ALM, ZB IIN ALM, B2 BRP LBBINI, B3 BC LBBINI, B5 DN2 LBBINI, B6 ULT LBBINI, B7 SHP LBBINI, B8RTSS LBBINI B2 BRPL TR, B3A BC B1 TR, B5 DN2 TR, B6 ULTC TR, B7 SHPRM TR, B8 RTSS TR, B10 PG1 TR, B11 PG2 TR Ir (max): 2.64 kA Iy (max): 1.10 kA Ib (max): 12.59 kA Dhone end DR on Gooty feeder:DR Trigger Time:22-05- 2026 06:58:57.006 Any Start, IN>1 Start DIST Start A, IN>1 Timer Block DIST Fwd Z2 Any Start, IN>1 Start DIST Start B, IN>1 Timer Block DIST Fwd, Z2 Any Trip, A/R Lockout, DIST Trip B AR Lockout Shot> L13 86A OP-LBBIN L14 86B OP-LBBIN L2 M CB OPN-Y, L3 M CB OPN-B L1 M CB OPN-R
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	Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead Any Pole Dead All Pole Dead All Pole Dead Ir (max): 1.56 kA Iy (max): 1.56 kA Ib (max): 0.40 kA Vr (max): 134.01 kV Vy (max): 192.51 kV Vb (max): 150.14 kV Main-1DR Trigger Time:22-05-2026 07:35:10.999 ZB COMMON TR, CHECK ZONE TR B2 BRP LBBINI, B3 BC LBB INI, B5 DN2 LBBINI, B6 ULT LBBINI, B7 SHP LBBINI, B8RTSS LBBINI B2 BRPL TR, B3A BC B2 TR, B5 DHN2 TR, B6 ULTC TR, B7 SHP TR, B8 RTSS TR, B10 PG1 TR, B11 PG2 TR B5 DN2 RETRIP B5 DN2 LBB TR ZB EXT BAY TR Ir (max): 0.53 kA Iy (max): 0.10 kA Ib (max): 0.18 kA Main-1_1DR Trigger Time:22-05-2026 07:32:43.946 ZB COMMON TR, CHECK ZONE TR B2 BRP LBBINI, B3 BC LBBINI, B5 DN2 LBBINI, B6 ULT LBBINI, B7 SHP LBBINI, B8 RTSSLBBINI B2 BRPL TR, B3A BC B1 TR, B5 DHN2 TR, B6 ULTC TR, B7 SHP TR, B8 RTSS TR, B10 PG1 TR, B11 PG2 TR B2 BRP RETRIP B2 BRP LBB TR
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	ZB EXT BAY TR Ir (max): 0.66 kA Iy (max): 1.57 kA Ib (max): 0.27 kA Y-Ph BBP relay at Gooty :DR Trigger Time:22-05-2026 07:35:10.999 ZB COMMON TR, CHECK ZONE TR B2 BRP LBBINI, B3 BC LBB INI, B5 DN2 LBBINI, B6 ULT LBBINI, B7 SHP LBBINI, B8RTSS LBBINI B2 BRPL TR, B3A BC B2 TR, B5 DHN2 TR, B6 ULTC TR, B7 SHP TR, B8 RTSS TR, B10 PG1 TR, B11 PG2 TR B5 DN2 RETRIP B5 DN2 LBB TR ZB EXT BAY TR Ir (max): 0.53 kA Iy (max): 0.10 kA Ib (max): 0.18 kA
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12. A) PMU Analysis:



From PMU, dip in B-pole is observed followed by RYB fault during the event.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Item	for review
ANSCO	1. Non opening of B-phase limb of 220kV Gooty SwS Dhone Line-2, Y-phase limb of 220kV Gooty SwS Boyareddypalli line at 220kV Gooty SwS.

	2. DT was not sent to remote ends after LBB operation fin 220kV Gooty SwS Bus-2.
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14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
APTRANSCO	The damaged disc insulator string and bus jumpers were replaced. The faulty busbar trip relays (96) pertaining to 220 kV Dhone-2 line and 220 kV Boyareddy palli line were replaced with the available spare relays in the 220 kV busbar protection panel after testing by availing line clear on the respective lines.

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

220 kV Ultratech line charged at 08:28 hrs

220 kV Boyareddy palli line charged at 09:08 hrs

220 kV Gooty RTSS line charged at 09:28 hrs

220 kV Shapuram line charged at 09:42 hrs

220 kV Dhone-2 line charged at 11:32 hrs

400/220 kV ICT-1 charged at 11:43 hrs

400/220 kV ICT-2 charged at 11:44 hrs

220 kV Bus-2 charged at 13:37 hrs after replacing the damaged disc insulator string and bus jumpers.

220 kV Bus coupler charged at 13:53 hrs.

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	APTRANSCO

2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	APTRANSCO
4	Any other non-compliance	IEGC section 17.3	PGCIL SR-1

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

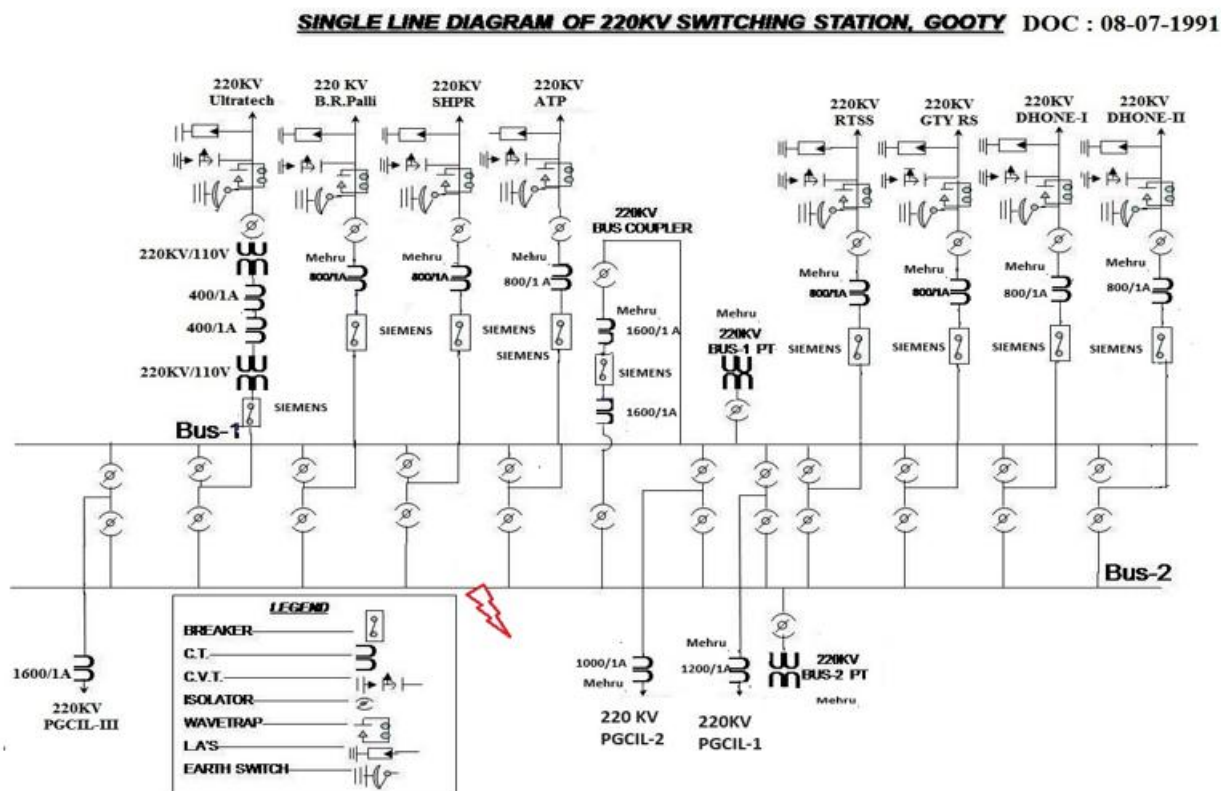
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
22-05-2026 07:38:33	GOOTY SWS CB COUPLER CB 20552 OPEN	GTYS2_AT
22-05-2026 07:38:33	GOOTY SWS CB 20352 (LINE TO SHPM2) OPEN	GTYS2_AT
22-05-2026 07:38:33	GOOTY SWS CB 20152 (LINE TO ULTR2) OPEN	GTYS2_AT
22-05-2026 07:38:35	GOOTY SWS CB 20252 (LINE TO BRPL2) OPEN	GTYS2_AT
22-05-2026 07:38:35	GOOTY SWS CB 21152 (LINE-2 TO DHON2) OPEN	GTYS2_AT
22-05-2026 07:38:43	GOOTY SWS CB 20852 (LINE TO GTRS2) BETWEEN	GTYS2_AT

Deliberations:

1. APTRANSCO stated that in the Antecedent conditions: Bus-1 elements : Dhone-1 , Gooty RS , Anantapur, ICT-3 Bus-2 elements : Dhone-2 , Gooty RTSS , ICT-1&2, Shapuram, Boyareddypalli , Ultratech . BUS coupler is in closed condition.



2. APTRANSCO stated that the Triggering incident occurred at 07:38 Hrs. 220 kV Bus-2 R-phase fault occurred due to flashover of the disc insulator string in 220 kV Bus-2 protection zone (between 220kV Shapuram and 220kV Boyareddypalli feeders).
3. APTRANSCO stated that for the above fault, 220kV Bus-2 Bus bar protection was operated and trip extended to all the connected elements. Y-ph circuit breaker limb of 220 kV Dhone-2 line at 220 kV SWS Gooty end did not trip due to failure of Y-phase TC-1 and TC-2 trip contacts of the 96-trip relay pertaining to 220 kV Dhone-2 line in the 220 kV busbar protection panel.
4. The B-ph circuit breaker limb of 220 kV Boyareddypalli line at 220 kV SWS Gooty end did not trip due to failure of B-phase TC-1 and TC-2 trip contacts of the 96-trip relay pertaining to 220 kV Boyareddypalli line in the 220 kV busbar protection panel.
5. SRPC enquired when the trip contacts are damaged at the time of incident or earlier. APTRANSCO stated that the trip contacts are damaged earlier.

6. APTRANSCO stated that the above fault in Bus bar in turn created a 3-Ph fault (faulty section of 220 kV Bus-2 R-phase has fallen on the ground as well as on the bus jumpers of the 220 kV Shapuram line resulting in grounding of all three phases of 220 kV Bus-2) in Bus-2 protection zone.
7. The fault was fed from Y-Ph of 220kV Dhone-2 feeder and B-Ph of Boyareddypalli feeder from remote ends for which Y & B phases of Bus bar protection of 220kV Bus-2 were operated and due to non-opening of CBs of 220kV Dhone-2 and 220kV Boyareddypalli feeders CBs at Gooty end, resulted in operation of Re-trip and back trip were operated.
8. For Dhone (line-2) and Boyareddypalli end, due to non-receipt of DT signal from Gooty end (for LBB operation) tripped on operation of Zone-2 protection.
9. Remedial action taken:
 - The damaged disc insulator string and bus jumpers were replaced.
 - The faulty busbar trip relays (96) pertaining to 220 kV Dhone-2 line and 220 kV Boyareddypalli line were replaced with the available spare relays in the 220 kV busbar protection panel after testing by availing line clear on the respective lines.
 - Direct trip for LBB protection is implemented at both ends for 220 kV Gooty SWS-Dhone line-2 on 29-05-2026 and for 220 kV Gooty SWS-Boyareddypalli line on 02-06-2026.
10. SRPC enquired the reason for not sending DT to the remote end. APTRANSCO stated that wiring is done for DT but configuration is pending at remote end and it was rectified now.

Recommendations:

-  ***APTRANSCO to complete the configuration of DT for all feeders at Gooty SWS.***
-  ***APTRANSCO to check the healthiness of CB of all feeders at Gooty SS.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
2	Tripping of 220kV Bus-2 at Lower Sileru PH of APGENCO	As per the reports submitted, the triggering incident was a circuit breaker closing back after hand tripping of the of Unit-4 at the LOWER SILERU end and leading to the LBB operation and tripping of all the elements connected to Bus-2 at Lower Sileru. This led to the Tripping of 220kV Bus-2 at Lower Sileru PH of APGENCO.	21-06-2026 01:33	0	0	GI-1	21-07-2026	18-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, the triggering incident was a circuit breaker closing back after hand tripping of the of Unit-4 at the LOWER SILERU end and leading to the LBB operation and tripping of all the elements connected to Bus-2 at Lower Sileru. This led to the Tripping of 220kV Bus-2 at Lower Sileru PH of APGENCO.

2. Time and Date of the Event (घटना का समय और दिनांक: 21-06-2026 01:33)

3. Event Category (ग्रिड घटना का प्रकार): GI-1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): ANDHRA PRADESH , TELANGANA , ANDHRA PRADESH

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Andhra Pradesh State Demand (MW)	9754	9752
Andhra Pradesh State Generation (MW)	8851	8734
Telangana State Demand (MW)	8541	8505

Telangana State Generation (MW)	5175	5173
Grid Frequency (Hz)	50.05	50.03
SR Demand (MW)	49204	49134
SR Generation (MW)	48678	48611

****Pre and post data of 1 minute before and after the event***

Elements under outage	
Weather Condition (मौसम स्थिति)	Rainy

Bus 2 Connected Elements
1. 220KV-ASUPAKA-LOWER_SILERU-1 2. 220KV-LOWER_SILERU-Chintur-1

Bus-2 connectivity at Lower Sileru

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 27 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

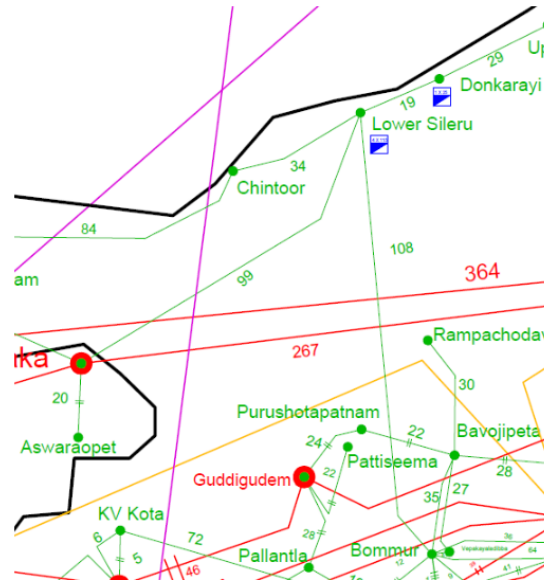
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-ASUPAKA-LOWER_SILERU-1
2. 220KV-LOWER_SILERU-Chintur-1
3. LOWER_SILERU - 220KV - Bus 2

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

As per the reports submitted, the triggering incident was a circuit breaker closure after hand tripping within around 150-200ms during de-paralleling of Unit-

4 at the LOWER SILERU end. Since hand tripping of the units have been mapped to LBB initiation, and due to the current after the breaker closure led to the Local Breaker Backup (LBB Zone-2) protection operation and all the elements connected to Bus-2 got tripped (220kV Asupaka–Lower Sileru-1, and 220kV Lower Sileru–Chinturu-1) at Lower Sileru end. From the DR data, DT was sent to Asupaka end for 220kV Asupaka–Lower Sileru-1. At the ASUPAKA end, DT was not received and the line was holding. There was no load loss or generation loss during the event.



11. DR Analysis:

LOWER_SILERU - 220KV

	LOWER_SILERU - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:21-06-2026 01:32:55.727 206_BFP_START 206_BACK_TR ZB COMON TRIP, ZB BFP TRIP, Bay06 PROT TR Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA DR Trigger Time:21-06-2026 01:32:55.786 DT SENT, DT SENT

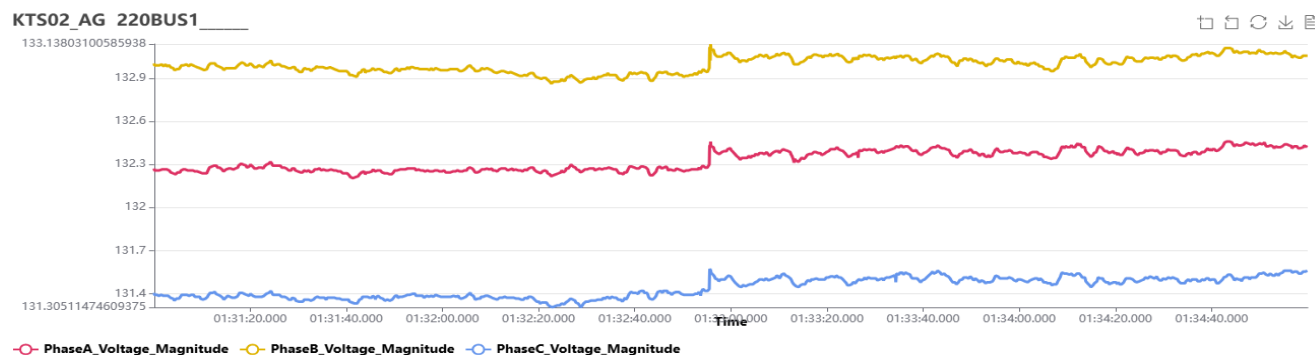
	CB OPEN R18 SPARE Ir (max): 0.03 kA Iy (max): 0.05 kA Ib (max): 0.03 kA Vr (max): 134.51 kV Vy (max): 134.41 kV Vb (max): 132.78 kV DR Trigger Time:21-06-2026 01:32:55.786 DT SENT, DT SENT CB OPEN R18 SPARE Ir (max): 0.03 kA Iy (max): 0.05 kA Ib (max): 0.03 kA Vr (max): 134.51 kV Vy (max): 134.41 kV Vb (max): 132.78 kV DR Trigger Time:21-06-2026 01:32:54.829 SPARE CB OPEN R18 SPARE R18 SPARE Ir (max): 0.05 kA Iy (max): 0.06 kA Ib (max): 0.04 kA Vr (max): 146.31 kV Vy (max): 138.21 kV Vb (max): 142.12 kV DR Trigger Time:21-06-2026 01:32:55.560 GCB Opened, T2W NS SENS GUPPDUP STR GUPPDUP STR HV EF4 STR GCB Opened, T2W NS SENS Ir (max): 1.26 kA Iy (max): 1.26 kA Ib (max): 1.03 kA Vr (max): 6.59 kV Vy (max): 6.56 kV Vb (max): 6.61 kV
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220KV-ASUPAKA-LOWER_SILERU-1

	LOWER_SILERU - 220KV	ASUPAKA - 220KV
Time Sync Issue	No	No

DR Analysis	DR Trigger Time:21-06-2026 01:32:55.786 DT SENT, DT SENT CB OPEN R18 SPARE Ir (max): 0.03 kA Iy (max): 0.05 kA Ib (max): 0.03 kA Vr (max): 134.51 kV Vy (max): 134.41 kV Vb (max): 132.78 kV	DR is not uploaded
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12. A) PMU Analysis:



From the PMU plot, there is no fault during the event

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
TGTRANSCO	1. Non receipt of DT during the event needs review (LOWER_SILERU end DT was sent as per 220KV-ASUPAKA-LOWER_SILERU-1 DR)
APGENCO	1. Closing of breaker after hand tripping in Unit-4 at LOWER_SILERU end needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
APGENCO	Breaker operations checked and found normal

15. RLDC Analysis/Observations (Based on Simulation Studies): NA**16. Restoration Details:**

21-06-2026 02:00

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl.No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	APGENCO
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TGTRANS CO, APGENCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	APGENCO
4	Any other non-compliance	IEGC section 17.3	

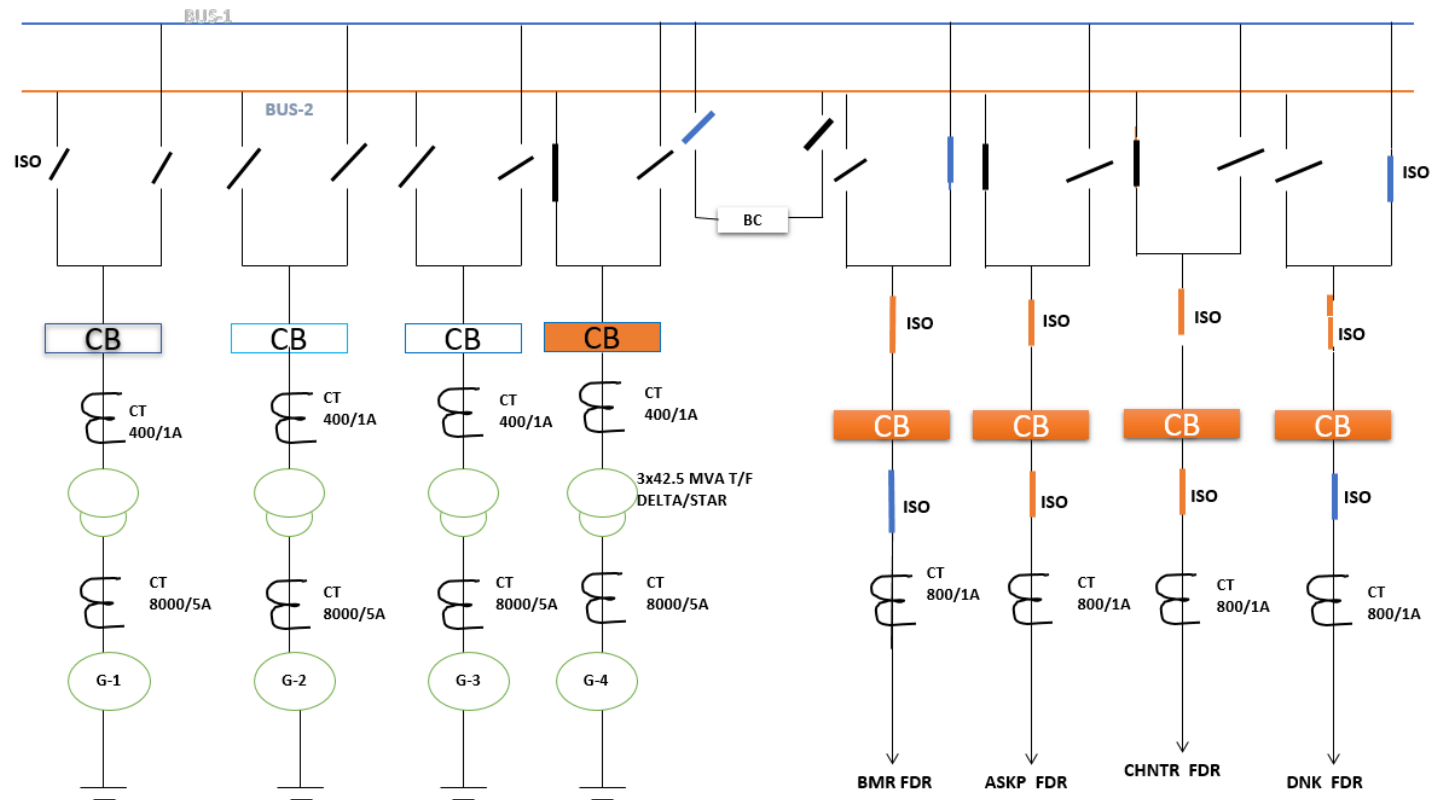
18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA**Annexure 1****Sequence of Events as per SCADA**

time	Event	Location
21-06-2026 01:33:06	LOWER SILERU CB 20452 (LINE TO CHIN2) OPEN	LSLR2_AG
21-06-2026 01:33:06	LOWER SILERU CB 20152 (LINE TO ASPK4) OPEN	LSLR2_AG
21-06-2026 01:33:06	LOWER SILERU CB CB 21052 (GT-4) INVALID	LSLR2_AG

Deliberations:

1. APGENCO stated that in the Antecedent condition the Bus-Coupler Breaker in open Condition. The 220 KV Bommuru and Donkarayi feeders on Bus-1, The 220 KV Asupaka feeder, Chinthuru feeder and Unit-4 on Bus-2.

BUS CONNECTED ELEMENTS DURING ANTECEDENT CONDITION



2. APGENCO stated that as per APLD instructions following sequence of operations are carried out
 - At 00:21 Hrs., the Unit-3 de-paralleled.
 - At 00:53 Hrs., the Unit-2 de-paralleled.
 - At 01:33 Hrs., the Unit-4 de-paralleled.
 - While hand tripped the Unit-4 Breaker, LBB Zone-2 Protection Operated at Lower Sileru end causing 220 KV Lower Sileru-Chinthuru and Lower Sileru-Asupaka feeders tripped at Lower Sileru end.
3. APGENCO stated that restriking current was observed within 150–200 ms, following which the backup trip operated. SRPC enquired about the non-

operation of the Re-trip function. APGENCO clarified that the LBB timer is initiated following any trip command and, since the current was observed after approximately 150 ms, the Re-trip timer had already elapsed, resulting in direct operation of the backup trip.

4. Remedial action taken: Since a spare breaker was not available, maintenance of the Unit-4 breaker was carried out and its opening and closing operations were checked and found satisfactory.
5. SRLDC raised concern regarding the breaker open and close commands observed in the event log. APGENCO clarified that the breaker did not close after opening and stated that the indication observed in the event log was due to the restriking voltage.
6. NTECL Vallur highlighted that, as per the DR, the digital signal corresponding to the breaker open status was observed to return to low after the breaker had opened, indicating a possible breaker close condition. APGENCO stated that the healthiness of the breaker was checked and found satisfactory.
7. MS, SRPC enquired about the commissioning status of the new Generator Circuit Breaker and Tie Bus-Coupler. APGENCO stated that the Purchase Order has been placed, the material is expected at site by September 2026, and commissioning is planned by October 2026.
8. SRPC enquired about the non-receipt of the Direct Trip (DT) signal at Asupaka end. APGENCO stated that the DT wiring for LBB has been completed, while end-to-end testing is pending, and assured that the testing would be completed at the earliest.

Recommendations:

-  ***TGTRANSCO and APGENCO to conduct end to end testing for enabling DT signal for Lower Sileru-Asupaka Lines.***
-  ***APGENCO to verify the healthiness of Generator Circuit Breaker.***
-  ***APGENCO requested to expedite the commissioning of the new GB and Coupler.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
3	Tripping of 220kV Bus-2 of VTPS Generating station of APGENCO	As per the reports submitted, the triggering incident was R-G fault in 220kV VTPS Chillakallu Line-1. At VTPS end, R-phase breaker was conducting current even after trip and 220kV LBB to operate. Immediately all elements connected to 220kV Bus-2 tripped at 220kV-VTPS except 220KV-VTPS-NUZVID-1 line which was feeding the fault. The fault was finally cleared when the line was tripped at NUZVID end. This led to the tripping of 220kV Bus-2 of VTPS Generating station of APGENCO	21-06-2026 05:05	620	0	GI-1	07-07-2026	30-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, the triggering incident was R-G fault in 220kV VTPS Chillakallu Line-1. At VTPS end, R-phase breaker was conducting current even after trip and 220kV LBB to operate. Immediately all elements connected to 220kV Bus-2 tripped at 220kV-VTPS except 220KV-VTPS-NUZVID-1 line which was feeding the fault. The fault was finally cleared when the line was tripped at NUZVID end. This led to the tripping of 220kV Bus-2 of VTPS Generating station of APGENCO

2. Time and Date of the Event (घटना का समय और दिनांक): 21-06-2026 05:05

3. Event Category (ग्रिड घटना का प्रकार): GI-1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): ANDHRA PRADESH

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

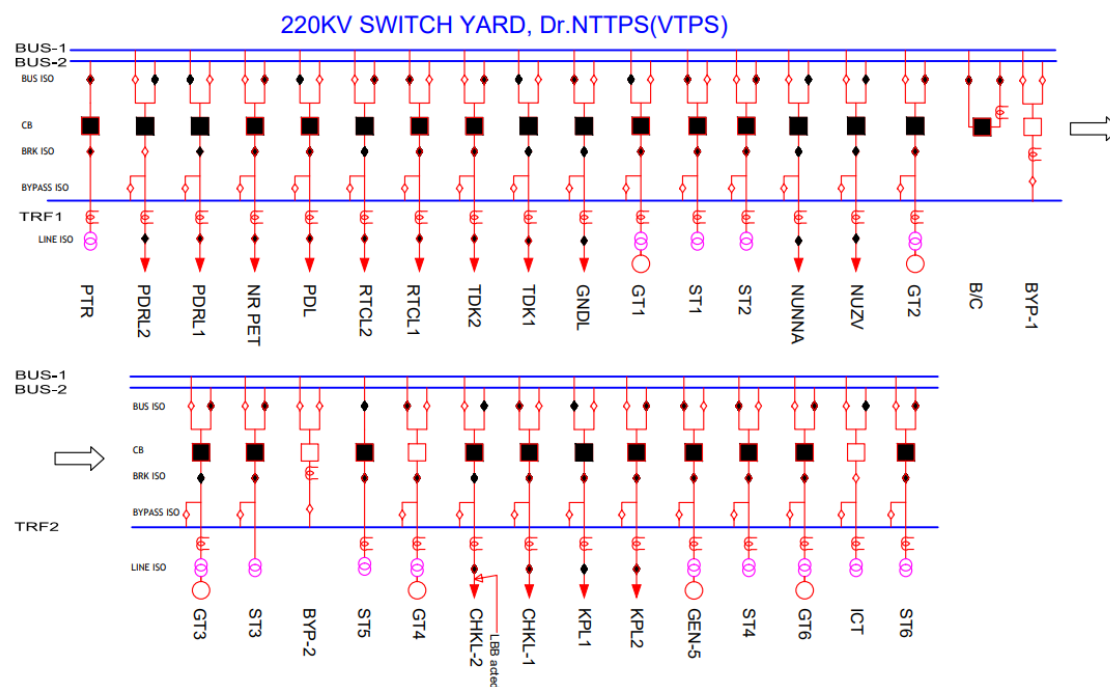
Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
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Andhra Pradesh State Demand (MW)	9567	9484
Andhra Pradesh State Generation (MW)	8520	7842
Grid Frequency (Hz)	49.94	49.86
SR Demand (MW)	49428	49461
SR Generation (MW)	46568	45839

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Cloudy

Bus configuration at VTPS - 220KV :



6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
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620.0 MW

0.0 MW

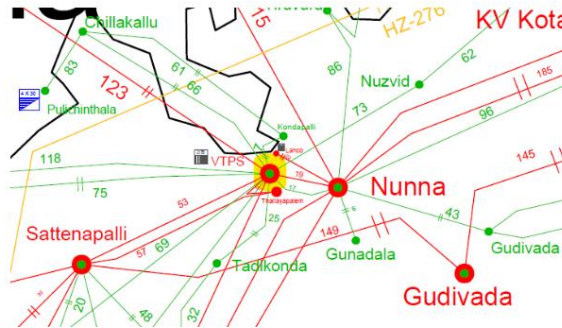
7. Duration of interruption (रुकावट की अवधि): 0 hours, 34 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-VTPS-CHILLAKALLU-2
2. 220KV-VTPS-RENTACHINTHALA-2
3. 220KV-TADIKONDA-VTPS-2
4. 220KV-GUNADALA-VTPS-2
5. 220KV-VTPS-NARSARAOPET-1
6. 220KV-VTPS-NUZVID-1
7. 220KV-KONDAPALLI-VTPS-2
8. 220KV-VTPS-PIDUGURALLA-2
9. VTPS - 220KV - Bus 2

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):



As per the reports submitted, the triggering incident is R-G fault on 220KV-VTPS-CHILLAKALLU-2 line. At VTPS end, the fault was detected in Z1 and breaker auxiliary contacts of all three phases indicated open status, however it failed to interrupt the fault current which persisted for more than 200ms. LBB operated after around 260 ms and gave trip command to CB of all bays of 220kV Bus-2 of VTPS. However, CB of 220KV-VTPS-NUZVID-1 line failed to open and was feeding the fault on 220KV-VTPS-CHILLAKALLU-2 line. After another 800ms, 220KV-VTPS-NUZVID-1 was tripped from remote end suspectedly on Z3 trip based on the time delay. During the same time units connected to (Unit-2,3 and 6) also tripped and further Unit-5 tripped on Flame Failure leading to a generation loss of around 620MW.

11. DR Analysis:

VTPS - 220KV

	VTPS - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:21-06-2026 05:04:04.299 >CBF 3-pole Device FltDet, Device Trip, CBF Trp.rp.3p CBF Trip L123 Ir (max): 4.17 kA Iy (max): 4.17 kA Ib (max): 4.17 kA DR Trigger Time:21-06-2026 05:04:04.440 >CBF 3-pole_BAY-20_CHKL2_7SS523 Device FltDet_BAY-20_CHKL2_7SS523, Device Trip_BAY-20_CHKL2_7SS523, CBF Trp.rp.3p_BAY- 20_CHKL2_7SS523 Device trip G_MCU_7SS522 Device FltDet_BAY-25_KPL-2_7SS523, Device FltDet_BAY-28_GT-6_7SS523 Device Trip_BAY-28_GT-6_7SS523, CBF Trip L123_BAY-28_GT-6_7SS523, Device FltDet_BAY-32_ST- 6_7SS523 Device FltDet_BAY-01_TDK-2_7SS523, Device FltDet_BAY-17_ST-3_7SS523, Device Trip_BAY-25_KPL- 2_7SS523, CBF Trip L123_BAY-25_KPL-2_7SS523, Device Trip_BAY-32_ST-6_7SS523, CBF Trip L123_BAY- 32_ST-6_7SS523 Device Trip_BAY-01_TDK-2_7SS523, CBF Trip L123_BAY-01_TDK-2_7SS523, Device FltDet_BAY- 05_ST-2_7SS523, Device Trip_BAY-05_ST-2_7SS523, CBF Trip L123_BAY-05_ST-2_7SS523, Device FltDet_BAY-06_NNA_7SS523, Device Trip_BAY- 06_NNA_7SS523, CBF Trip L123_BAY-06_NNA_7SS523, Device Trip_BAY-17_ST-3_7SS523, CBF Trip L123_BAY-

	17_ST-3_7SS523, CBF Trip L123_BAY- 20_CHKL2_7SS523 Device FltDet_BAY-08_GT-2_7SS523, Device FltDet_BAY-16_GT-3_7SS523, Device FltDet_BAY- 30_PTR_7SS523, Device Trip_BAY-30_PTR_7SS523, CBF Trip L123_BAY-30_PTR_7SS523 Device Trip_BAY-08_GT-2_7SS523, CBF Trip L123_BAY-08_GT-2_7SS523, Device FltDet_BAY- 09_BC_7SS523, Device Trip_BAY-16_GT-3_7SS523, CBF Trip L123_BAY-16_GT-3_7SS523 Device Trip_BAY-09_BC_7SS523, CBF Trip L123_BAY- 09_BC_7SS523 Device FltDet_BAY-07_NUZVID_7SS523, Device FltDet_BAY-22_NRPT_7SS523 Device Trip_BAY-07_NUZVID_7SS523, CBF Trip L123_BAY-07_NUZVID_7SS523, Device FltDet_BAY- 15_RTCL2_7SS523, Device Trip_BAY- 15_RTCL2_7SS523, CBF Trip L123_BAY- 15_RTCL2_7SS523, Device Trip_BAY-22_NRPT_7SS523, CBF Trip L123_BAY-22_NRPT_7SS523 Device FltDet_BAY-34_PDR2_7SS523, Device Trip_BAY- 34_PDR2_7SS523, CBF Trip L123_BAY- 34_PDR2_7SS523 Transf. Trip G_MCU_7SS522 >CBF L1_BAY-34_PDR2_7SS523, >CBF L2_BAY- 34_PDR2_7SS523, >CBF L3_BAY-34_PDR2_7SS523 >CBF 3-pole_BAY-32_ST-6_7SS523 >CBF 3-pole_BAY-17_ST-3_7SS523 >CBF 3-pole_BAY-05_ST-2_7SS523 >CBF 3-pole_BAY-30_PTR_7SS523 >CBF 3-pole_BAY-08_GT-2_7SS523 >CBF 3-pole_BAY-28_GT-6_7SS523 >CBF 3-pole_BAY-16_GT-3_7SS523 Ir (max): 0.14 kA Iy (max): 0.14 kA Ib (max): 0.14 kA
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	DR Trigger Time:21-06-2026 05:04:04.207 BRC START ZM04-START, PHS-STFWL1, PHS-STFWPE, PHS START ZM02-START, ZM03-START TRIP L1, TRIP L2, TRIP L3, ZM01-TRIP, ZM01-START, TRIP_Rph_MCB, TRIP_Yph_MCB, TRIP_Bph_MCB, TRIP_Rph_TCB, TRIP_Yph_TCB, TRIP_Bph_TCB CARR RECIEVE, TEF1-START CARR SEND, TRIP_Rph_86, TRIP_Yph_86, TRIP_Bph_86 ZCOM-TRIP B/B OPTD ZM02-TRIP TEF1-START TEF1-START TEF1-START ZM03-TRIP Ir (max): 4.21 kA Iy (max): 0.18 kA Ib (max): 0.20 kA Vr (max): 130.07 kV Vy (max): 165.85 kV Vb (max): 141.72 kV DR Trigger Time:21-06-2026 05:04:04.328 POWER SWING 50DD OSC TRIGGER On, GND DIST Z2 PKP, GND DIST Z3 PKP, GND DIST Z4 PKP, CARR RECD On, PUTT OP GND DIST Z1 OP, GND DIST Z1 PKP, PUTT TX1 CB B CLOSE Off CB Y CLOSE Off, GND DIST Z2 PKP, GND DIST Z3 PKP, GND DIST Z4 PKP, PUTT OP CB R CLOSE Off OSC TRIGGER On, BB PROT.OPTD On POWER SWING 50DD POWER SWING 50DD Ir (max): 4.26 kA Iy (max): 0.18 kA Ib (max): 0.20 kA
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	Vr (max): 132.31 kV Vy (max): 146.73 kV Vb (max): 219.99 kV
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220KV-VTPS-NUZVID-1

	VTPS - 220KV	NUZVID - 220KV
Time Sync Issue	No	No
DR Analysis		

220KV-VTPS-CHILLAKALLU-2

	VTPS - 220KV	CHILLAKALLU - 220KV
Time Sync Issue	No	Yes
DR Analysis		DR Trigger Time:21-06-2026 05:04:02.768 1ph Fault, R12 86A TR-Z2_..., R18 86B TR-Z2_.. Any Trip, DIST Trip A, Z1, DIST Sig. Send, 3P Trip, R8 CARR SEND CH1, R7 CARR SEND CH2 L9 M2LBBINR/ARIN DIST. Chan Recv, L8 CARR REC CH1 Ir (max): 6.23 kA Iy (max): 0.20 kA Ib (max): 0.22 kA Vr (max): 133.05 kV Vy (max): 138.27 kV Vb (max): 137.31 kV

12. A) PMU Analysis:



From the PMU plots, R-G fault can be observed with delayed fault clearing. Also, delayed tripping of 220KV-VTPS-NUZVID-1 line can be observed.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
APGENCO	1. DT not sent to remote ends of lines connected to Bus-2 during LBB operation needs review 2. Non opening of R pole of 220KV-VTPS-NUZVID-1 at VTPS end needs review 3. Breaker Failure for 220KV-VTPS-CHILLAKALLU-2 at VTPS end needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
APGENCO	Suspecting that CB failed due to poor quality of SF6 in the interrupt chamber. Hence SF6 Gas analysis test will be conducted on the remaining all the breakers.

15. RLDC Analysis/Observations (Based on Simulation Studies):NA**16. Restoration Details:**

220 kV Bus-2 normalized by charging 220 kV VTPS-Pidigurala-2 at 05:40 Hrs. Subsequently elements were restored.

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

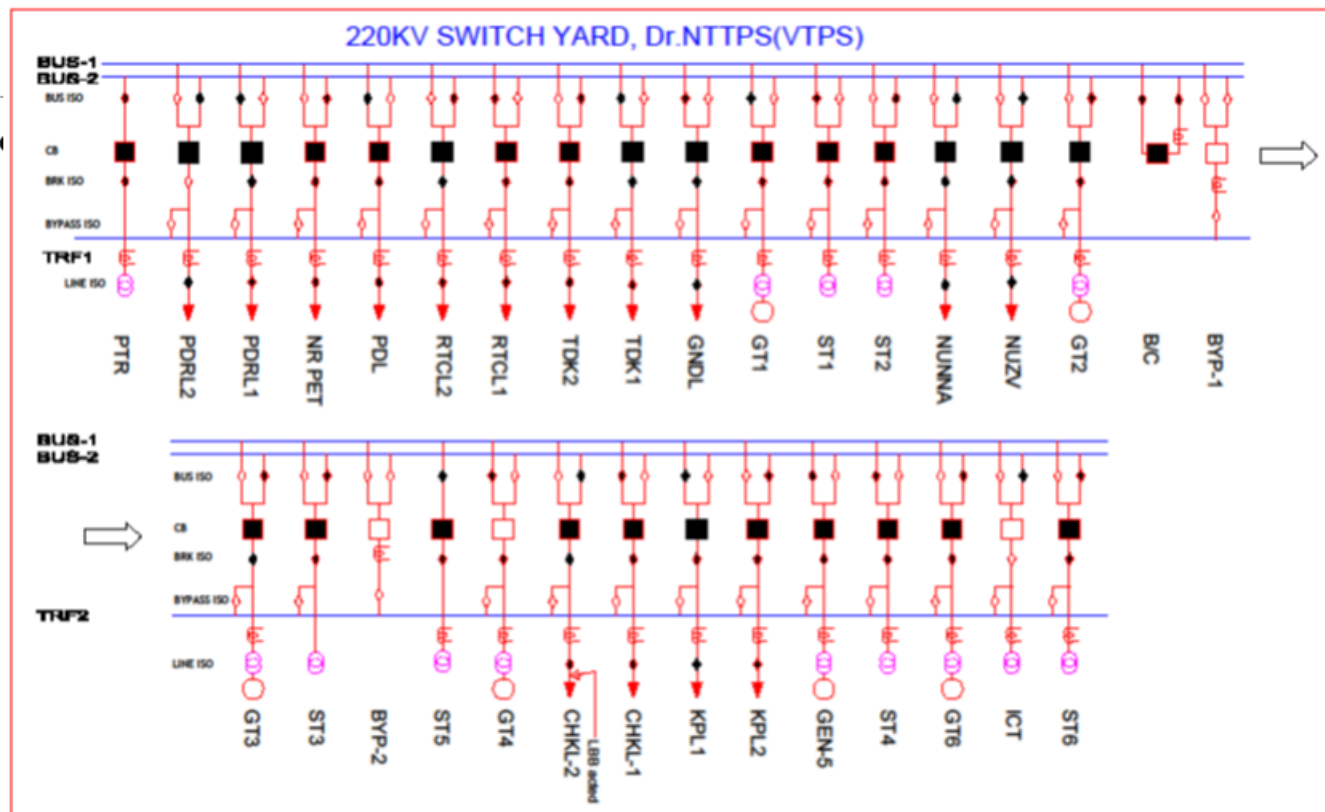
Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	APGENCO
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	APTRANSCO, APGENCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	APGENCO
4	Any other non-compliance	IEGC section 17.3	APTRANSCO, APGENCO

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA**Annexure 1****Sequence of Events as per SCADA**

time	Event	Location
21-06-2026 05:04:07	NUZVID CB 20252 (LINE TO VTSO2) OPEN	NZVD2_AT
21-06-2026 05:04:14	VTPS OLD STAGE CB 20452 (LINE-2 TO RTCL2) OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB 22452 (LINE-2 TO KNDP2) OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB CB 22752 (GT-6) OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB 20752 (LINE-2 TO TDKD2) OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB 21852 (T3_P) OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB CB 21452 (GT-2) OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB COUPLER CB 21552 OPEN	VTSO2_AG
21-06-2026 05:04:14	VTPS OLD STAGE CB 22152 (LINE-2 TO CLKL2) OPEN	VTSO2_AG

Deliberations:

1. APGENCO stated that in the antecedent conditions at 220KV VTPS they have Two Main BUS with Bus coupler and Transfer Bus arrangement. Always the Bus coupler is in closed condition.



2. APGENCO stated that on 21.06.2026, R-G fault occurred in 220kV VTPS Chillakallu-2 Line. At VTPS end, R-pole open feedback has come but current in the R-phase persisted for more than 200msec.Hence LBB to operated and all elements connected to the Bus-2 tripped. This led to the Tripping of 220kV Bus-2.
3. Remedial action taken:
 - The Chillakallu-2 feeder kept on Transfer bus on 21.06.2026 at 14.54Hrs. The faulty CB has to be replaced with new CB.
 - The SF6 gas quality is being tested for the remaining CBs with the SF6 gas quality analyzer.
 - Wherever SF6 gas quality is found abnormal, SF6 gas will be replaced with fresh gas.
 - New CBs procurement is under process. CBs which are working for more than 20 years will be replaced with new CBs

4. SRPC enquired about the non-issuance of Direct Trip (DT) to the remote end. APGENCO stated that OP Relay-3 had been assigned instead of OP Relay-4 in the Busbar Bay Unit. The configuration has since been rectified and OP Relay-4 has been assigned.
5. SRPC enquired about the delayed opening of the Nuzvid feeder breaker. APGENCO stated that a delay in opening of the R- and Y-phase poles of the Nuzvid feeder breaker was observed. The circuit breaker was overhauled, during which the valve seats, rollers and O-rings of all phases were replaced, and the mechanism was lubricated. Further, the SF6 gas quality was checked and the circuit breaker was tested by initiating protection trip commands and verifying the breaker operating times. The breaker was found to be healthy.
6. MS, SRPC enquired about the status of replacement of old circuit breakers. APGENCO stated that procurement is under progress, with one circuit breaker expected to be procured within three months, while tendering for 10 additional circuit breakers is under process at the Head Office level.
7. SRPC highlighted the DR time sync issue at CHILLAKALLU end and requested APTRANSCO to rectify the same.

Recommendations:

✚ APTRANSCO to rectify the DR time sync issue at Chilakallu end

✚ APGENCO to check the DT send wiring for all feeders at VTPS end.

✚ APGENCO requested to expedite the Breaker replacement.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
4	Tripping of 400kV Bus-2 of 400kV Alamathy SS of TANTRANSCO	The triggering incident is a tripping of 400 kV Bus-2 at 400 kV Alamathy Substation due to the mal operation of 400kV Bus-2 Busbar Protection (BBP) with no fault during the event. This led to Tripping of 400kV Bus-2 of 400kV Alamathy SS of TANTRANSCO	26-06-2026 19:22	0	0	GI-2	08-07-2026	01-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

The triggering incident is a tripping of 400 kV Bus-2 at 400 kV Alamathy Substation due to the operation of 400kV Bus-2 Busbar Protection(BBP) with no fault during the event. This led to Tripping of 400kV Alamathy SS of TANTRANSCO.

2. Time and Date of the Event (घटना का समय और दिनांक): 26-06-2026 19:22

3. Event Category (ग्रिड घटना का प्रकार): GI-2

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): TAMILNADU

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
TamilNadu State Demand (MW)	19778	19731
TamilNadu State Generation (MW)	9021	9010
Grid Frequency (Hz)	49.94	49.92
SR Demand (MW)	55360	55284
SR Generation (MW)	52954	53003

**Pre and post data of 1 minute before and after the event*

Elements under outage	1. 400KV-ALAMATHY-SUNGAVARACHATRAM-2
Weather Condition (मौसम स्थिति)	Normal

Bus 1 Connected Elements

1. 400KV-VALLUR-ALAMATHY-1
2. 400KV-ALAMATHY-SUNGAVARACHATRAM-1
3. 400KV/230KV ALAMATHY-ICT-3
4. 400KV-ALAMATHY-NCTPS_STAGE_II-2
5. 400KV/110KV ALAMATHY-ICT-1
6. 400KV/110KV ALAMATHY-ICT-2

Bus 2 Connected Elements

1. 400KV-ALAMATHY-TIRUVALAM_TN-1
2. 400KV/230KV ALAMATHY-ICT-4
3. 400KV-VALLUR-ALAMATHY-2
4. 400KV-ALAMATHY-MANALI-1
5. 400KV/110KV ALAMATHY-ICT-6

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

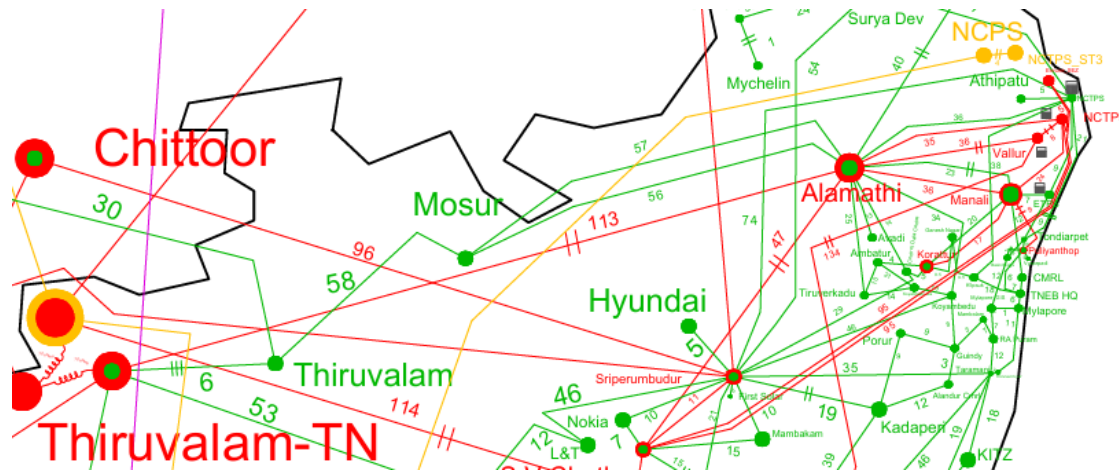
7. Duration of interruption (रुकावट की अवधि): 4 hours, 12 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

As per the reports submitted, the triggering incident is the operation of the 400 kV Bus Bar Protection (High Impedance Scheme) at 400 kV Alamathy Substation. Before the event, the Main CB of the 400KV-ALAMATHY-SUNGAVARACHATRAM-2 was out of service due to a bus isolator defect, and the line was kept in service through the Tie CB. During the event, the Bus Bar Protection operated and only the Main CB of Bus-B tripped. All other elements remained in service through the Tie CB. No visible fault was observed at the substation.

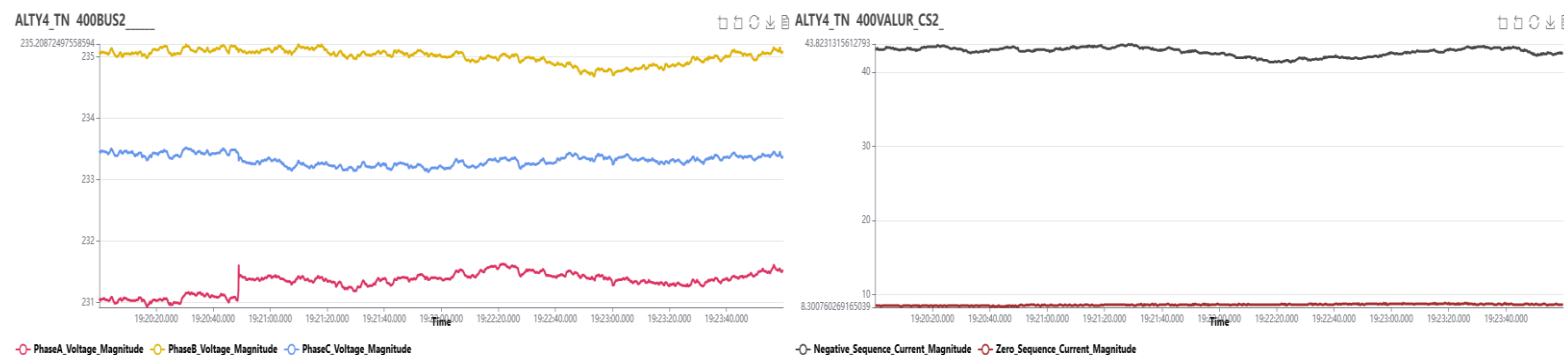


11. DR Analysis:

ALAMATHY - 400KV

	ALAMATHY - 400KV
Time Sync Issue	No
DR Analysis	DR Not Submitted

12. A) PMU Analysis:



From the PMU data, no fault was observed during the event.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
TANTRANSCO	1. Busbar Protection at 400kV Bus-2 of 400kV Alamathy SS without any fault needs review.

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
TANTRANSCO	No visible fault noticed. Test charged bus & stood OK

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

Name of element	Restoration date & time
400kV Thiruvallam 1 Feeder Main CB	Normalized at 23.34 hrs / 26.06.2026
400/230kV ICT – 4 HV Main CB	Normalized at 23.50 hrs / 26.06.2026
400kV Vallur -2 Feeder Main CB	Normalized at 23.51 hrs / 26.06.2026
400kV Manali Feeder Main CB	Normalized at 23.52 hrs / 26.06.2026
400/110kV ICT -6 HV Main CB	Normalized at 23.56 hrs / 26.06.2026

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

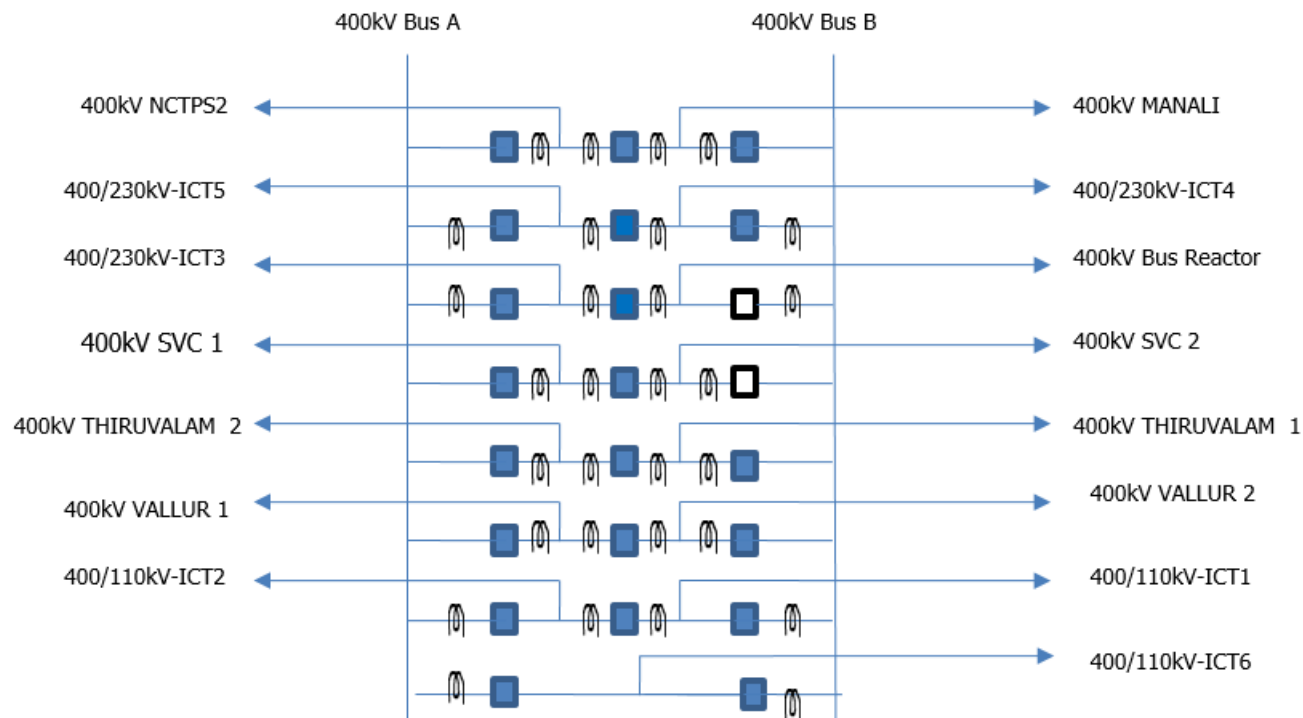
Annexure 1

Sequence of Events as per SCADA

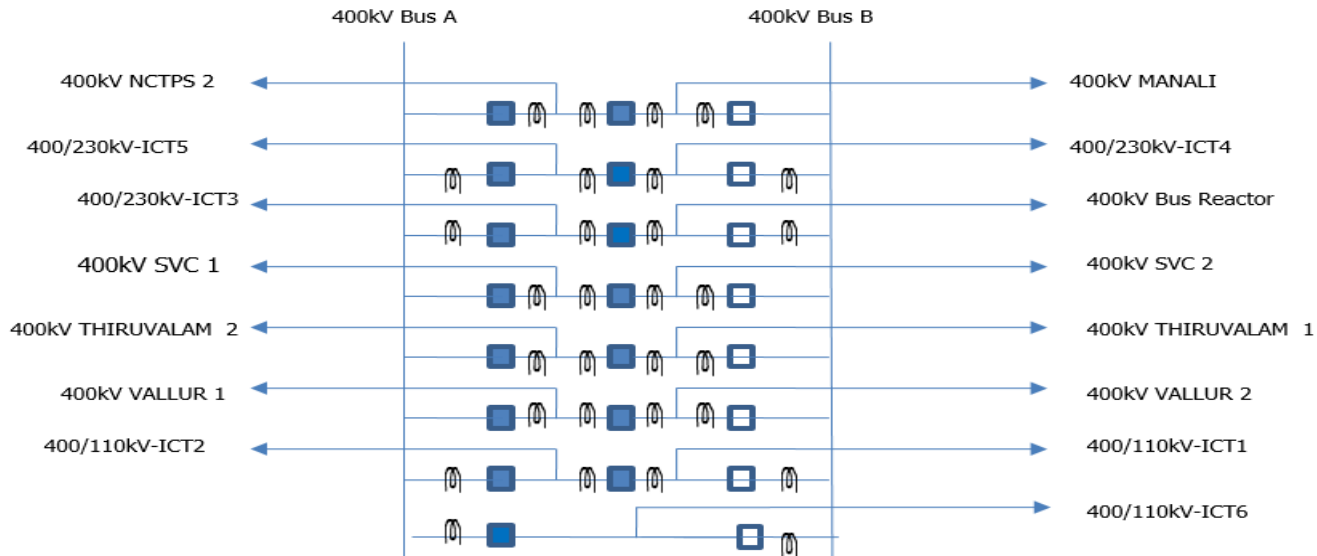
time	Event	Location
26-06-2026 19:21:01	ALAMATY 400\230 CB TIE 10 - CB 41052 OPEN	ALTY4_TN
26-06-2026 19:21:01	ALAMATY 400\230 CB TIE 14 - CB 41452 OPEN	ALTY4_TN
26-06-2026 19:21:01	ALAMATY 400\230 CB TIE 01 - CB 40152 OPEN	ALTY4_TN
26-06-2026 19:21:01	ALAMATY 400\230 CB TIE 04 - CB 40452 OPEN	ALTY4_TN
26-06-2026 19:21:01	ALAMATY 400\230 CB TIE 19 - CB 41952 OPEN	ALTY4_TN
26-06-2026 19:21:01	ALAMATY 400\230 CB TIE 22 - CB 42252 OPEN	ALTY4_TN
26-06-2026 19:21:19	ALAMATY 400\230 CB TIE 10 - CB 41052 CLOSED	ALTY4_TN

Deliberations:

1. TANTRANSCO stated that in the antecedent conditions all elements were in service and BUS Coupler is in closed condition.



2. TANTRANSCO stated that on 26-06-2026 at 19:22 hrs spurious tripping of high Impedance BBP.2 observed in 400kV Bus B. During the incident No fault was observed. All elements were in service through Tie breaker. ICT 6 was in service through main breaker of Bus A.



3. Remedial action taken:

- Yard condition checked and no visible fault Noticed.
- 400kV Bus B test charged through 400kV Thiruvallam.1 on 26-06-2026 at 23:41 hrs & stood OK
- Numerical BBP relay allotted , Configuration completed & Cable laying pending addressed to System operation wing.

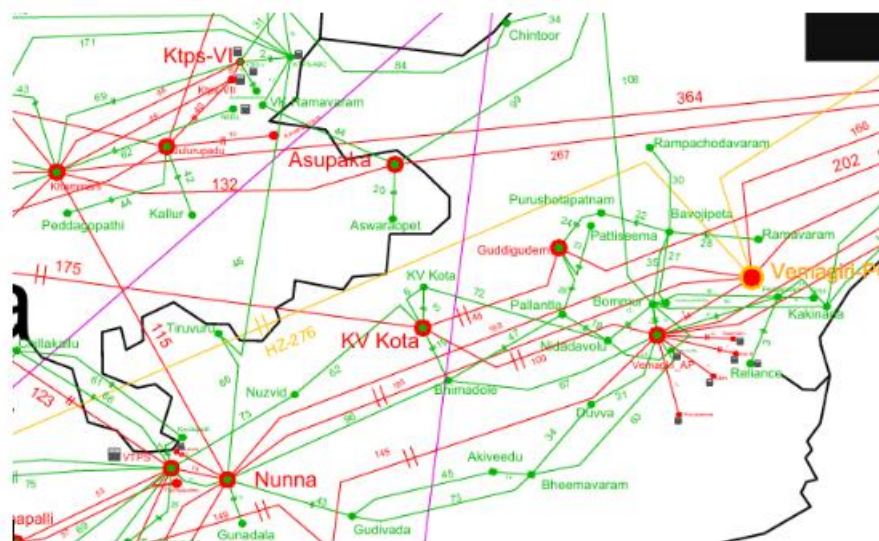
4. SRPC enquired about the timeline for replacement of static relay with numerical relay. TANTRANSCO stated that they would complete the work in 6 months duration.

Recommendations:

TANTRANSCO to expedite the replacement of static relay with numerical relay.

S. No	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
5	Tripping of 220kV Bus of 220kV KV Kota SS of APTRANSCO	220kV KV Kota is operating with single bus configuration. As per the reports submitted, the triggering incident is the failure of the CT cable connected to the 220kV BBP circuit in the 220kV KV Kota Nidadavolu feeder bay at KV Kota end. The CT cable failure resulted in the operation of the 220kV BBP operation which led to the tripping of 220kV Bus of 220 kV Kota Substation. 132kV side was intact during the event.	27-06-2026 22:04	0	0	GI-1	10-07-2026	03-07-2026	Considered

SLD of the affected Sub-station/Connectivity Diagram:



Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV KV Kota is operating with single bus configuration. As per the reports submitted, the triggering incident is the failure of the CT cable connected to the 220kV BBP circuit in the 220kV KV Kota Nidadavolu feeder bay at KV Kota end. The CT cable failure resulted in the operation of the 220kV BBP operation which led to the tripping of 220kV Bus of 220 kV Kota Substation. 132kV side was intact during the event.

2. Time and Date of the Event (घटना का समय और दिनांक: 27-06-2026 22:04

3. Event Category (ग्रिड घटना का प्रकार): GI-1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): ANDHRA PRADESH

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Andhra Pradesh State Demand (MW)	11311	11319
Andhra Pradesh State Generation (MW)	8023	8047
Grid Frequency (Hz)	50.02	49.94
SR Demand (MW)	55035	55112
SR Generation (MW)	53772	53817

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Rainy

Bus Configuration Type at 220kV KV Kota SS: Single Bus

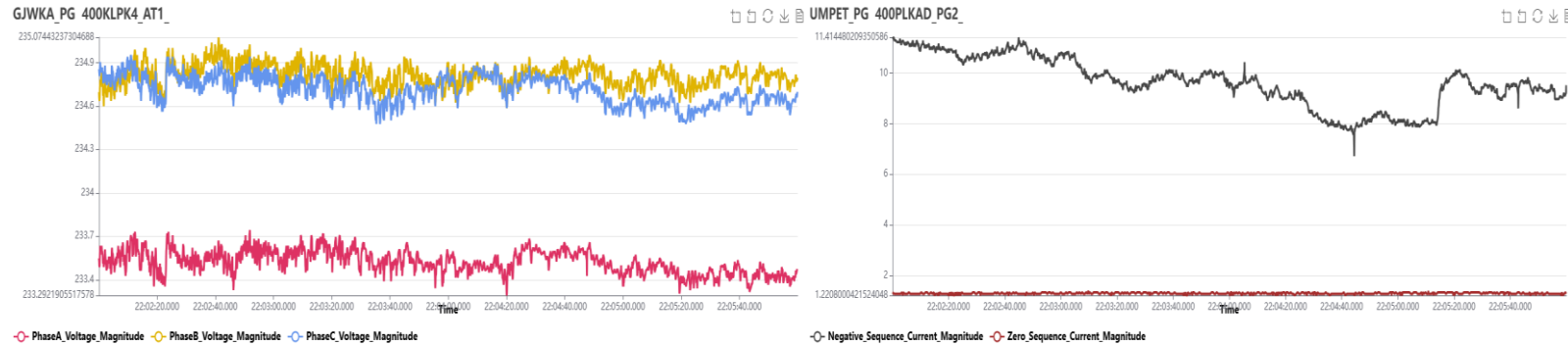
6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

	BUS 1 BIASED OP, BUS 6 OP, BUS 6 BIASED PKP, BUS 6 BIASED OP, 160MVA PTR-1 ON (VO3), 100MVA PTR-2 ON (VO4), 100MVA PTR-3 ON (VO5), 220KV K.KOTA TIE-1 ON (VO6), 220KV K.KOTA TIE-2 ON (VO7), 220KV K.KOTA TIE-3 ON (VO8) ANY TRIP ON (VO1), BUS 1 BIASED PKP, BUS 1 BIASED OP, BUS 6 BIASED PKP, BUS 6 BIASED OP, 160MVA PTR-1 ON (VO3), 100MVA PTR-2 ON (VO4), 100MVA PTR-3 ON (VO5), 220KV K.KOTA TIE-1 ON (VO6), 220KV K.KOTA TIE-2 ON (VO7), 220KV K.KOTA TIE-3 ON (VO8) ANY TRIP ON (VO1), BUS 6 BIASED PKP, BUS 6 BIASED OP, 160MVA PTR-1 ON (VO3), 100MVA PTR-2 ON (VO4), 100MVA PTR-3 ON (VO5), 220KV K.KOTA TIE-1 ON (VO6), 220KV K.KOTA TIE-2 ON (VO7), 220KV K.KOTA TIE-3 ON (VO8) ANY TRIP ON (VO1), BUS 1 BIASED PKP, BUS 1 BIASED OP, BUS 6 BIASED PKP, BUS 6 BIASED OP, 160MVA PTR-1 ON (VO3), 100MVA PTR-2 ON (VO4), 100MVA PTR-3 ON (VO5), 220KV K.KOTA TIE-1 ON (VO6), 220KV K.KOTA TIE-2 ON (VO7), 220KV K.KOTA TIE-3 ON (VO8) ANY TRIP ON (VO1), BUS 1 OP, BUS 1 BIASED PKP, BUS 1 BIASED OP, BUS 6 OP, BUS 6 BIASED PKP, BUS 6 BIASED OP, 160MVA PTR-1 ON (VO3), 100MVA PTR-2 ON (VO4), 100MVA PTR-3 ON (VO5), 220KV K.KOTA TIE-1 ON (VO6), 220KV K.KOTA TIE-2 ON (VO7), 220KV K.KOTA TIE-3 ON (VO8) BUS 1 BIASED PKP, BUS 1 BIASED OP ANY TRIP ON (VO1), BUS 6 BIASED PKP, BUS 6 BIASED OP, 160MVA PTR-1 ON (VO3), 100MVA PTR-2 ON (VO4), 100MVA PTR-3 ON (VO5), 220KV K.KOTA TIE-1 ON (VO6), 220KV K.KOTA TIE-2 ON
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(VO7), 220KV K.KOTA TIE-3 ON (VO8)
Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA

12. A) PMU Analysis:



From the PMU data, no fault is observed during the event.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
APTRANSCO	Issue with CT cable connected to BBP in 220kV KV Kota Nidadavolu feeder bay needs review.

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
APTRANSCO	Failed CT cable replaced

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

<i>S. No</i>	<i>Element</i>	<i>Date</i>	<i>Time (Hrs)</i>
1	Tie-1 feeder	27/06/26	22:38
2	Tie-2 feeder	27/06/26	22:39
3	160MVA PTR-1	27/06/26	22:42
4	100MVA PTR-2	27/06/26	23:03
5	Tie-3 feeder	27/06/26	23:10
6	100MVA PTR-3	27/06/26	23:27
7	Nidadavolu feeder	27/06/26	23:33
8	160MVA PTR-4	27/06/26	23:56

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl .N o	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	APTRANSCO
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

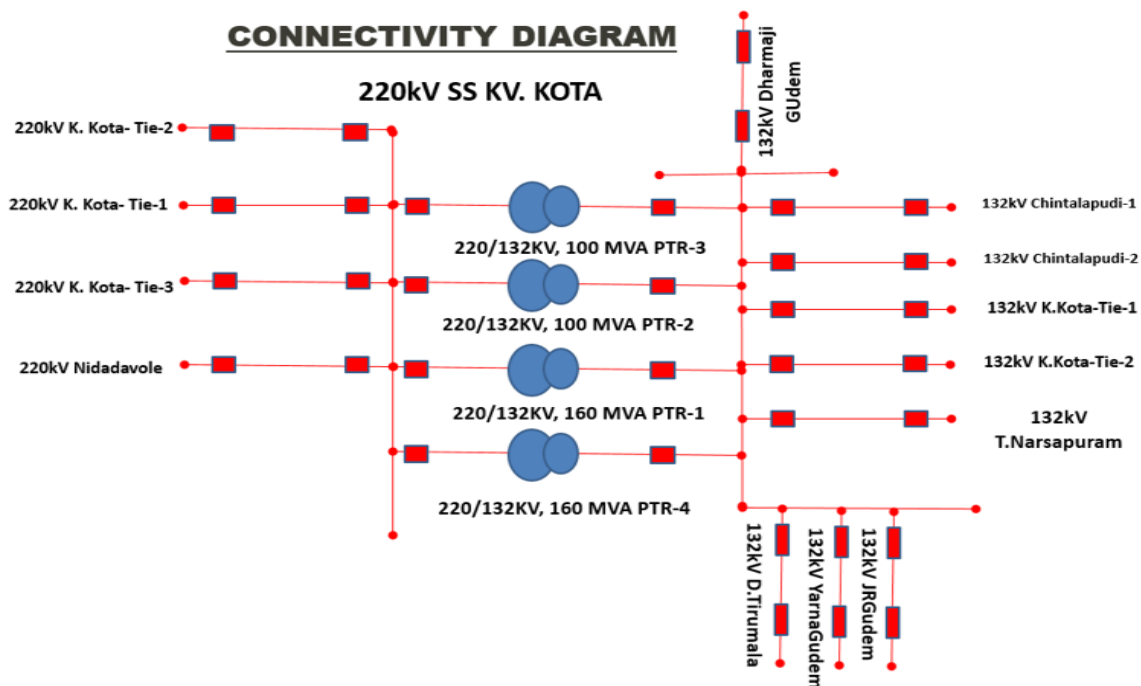
Sequence of Events as per SCADA

time	Event	Location
27-06-2026 22:02:23	KV KOTA 400 CB 20852 (LINE-3 TO KVKT2) OPEN	KVKT4_AT

Deliberations:

1. APTRANSCO stated that in the Antecedent conditions: At 220kV SS, KV Kota Single bus configuration is available and following elements are in service.

SLD OF 220kV SS, KV KOTA



2. APTRANSCO stated that there was no fault in Bus protection zone. Failure of CT cable pertaining to the 220kV Nidadavolu feeder bay resulted in operation of B-Ph Bus bar protection. For this 220kV Bus bar protection operated and tripped all the connected elements.
3. Remedial Action taken: Failed CT cable was replaced with healthy cable. Ensured healthiness of BBP.
4. SRPC enquired the reason for single bus configuration at KV Kota SS. APTRANSCO stated that due to space constraints double bus configuration is not feasible.
5. SRPC requested APTRANSCO to verify the healthiness of control cables at KV Kota SS.

Recommendations:

- ✚ **APTRANSCO to check the healthiness of control cables at KVKOTA SS.**
- ✚ **APTRANSCO to implement Double Bus configuration at KV KOTA SS.**

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
6	Tripping of 400kV Bus-2 at Devanahalli of KPTCL	As per the reports submitted, 400/220kV ICT-2 was under maintenance for relay calibration. During calibration and current injection differential relay protection operated and since the current was persisting, LBB operated and tripped all the main breakers connected to Bus-2 and tie breaker of ICT-3 leading to the Tripping of 400kV Bus-2 at Devanahalli of KPTCL and 400/220kV ICT-3 at Devanahalli.	05-07-2026 12:03	0	0	GI-2	24-07-2026	-	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, 400/220kV ICT-2 was under maintenance for relay calibration. During calibration and current injection differential relay protection operated and since the current was persisting, LBB operated and tripped all the main breakers connected to Bus-2 and tie breaker of ICT-3 leading to the Tripping of 400kV Bus-2 at Devanahalli of KPTCL and 400/220kV ICT-3 at Devanahalli.

2. Time and Date of the Event (घटना का समय और दिनांक): 05-07-2026 12:03

3. Event Category (ग्रिड घटना का प्रकार): GI-2

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): KARNATAKA

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Karnataka State Demand (MW)	9320	9381
Karnataka State Generation (MW)	9954	10020
Grid Frequency (Hz)	50.28	50.25

SR Demand (MW)	47730	47447
SR Generation (MW)	52744	52931

**Pre and post data of 1 minute before and after the event*

Elements under outage	1. 400KV/220KV DEVANAHALLI-ICT-2
Weather Condition (मौसम स्थिति)	Windy

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

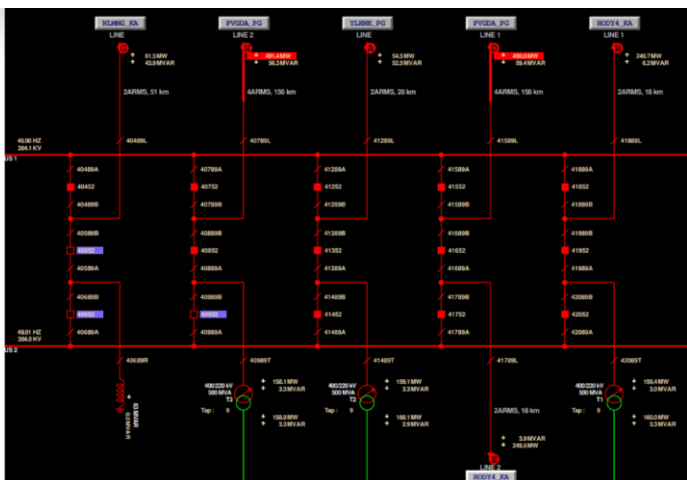
7. Duration of interruption (रुकावट की अवधि): 0 hours, 29 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV/220KV DEVANAHALLI-ICT-3
2. DEVANAHALLI - 400KV - Bus 2

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):



400kV Devanahalli SS is equipped with one and half breaker scheme with the configuration as shown above. As per the reports submitted, 400/220kV ICT-2 was under maintenance for relay calibration. During testing activity and current injection in the differential relay where in the differential protection operated and since the current was persisting during testing, LBB bus trip command operated (which should have been disabled during testing) and tripped all the main breakers connected to Bus-2 and further also tripped the tie breaker of ICT-3. This led to the Tripping of 400kV Bus-2 at Devanahalli of KPTCL and 400/220kV ICT-3 at Devanahalli. 400kV Bus-1 was in service and due to one and half breaker scheme, all elements other than 400/220kV ICT-3 were in service during the event.

11. DR Analysis:

DEVANAHALLI - 400KV

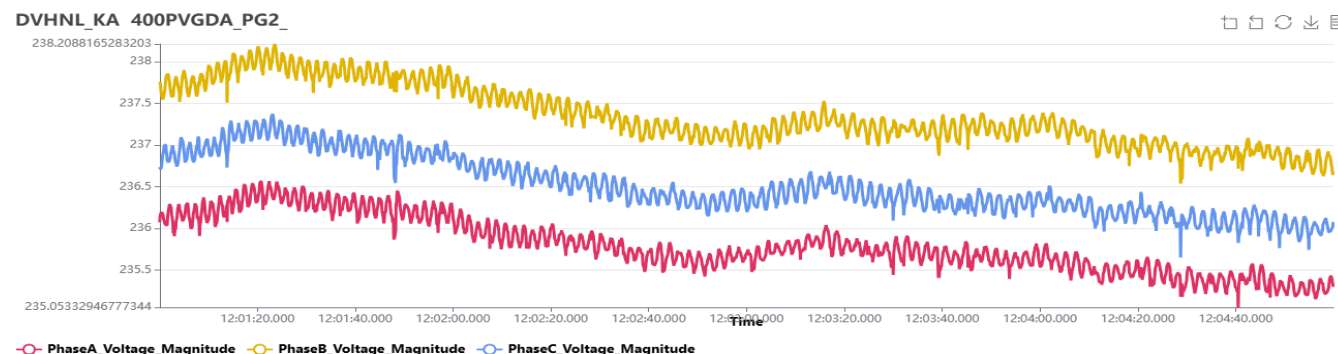
	DEVANAHALLI - 400KV
Time Sync Issue	No
DR Analysis	No DR submitted

400KV/220KV DEVANAHALLI-ICT-3

	DEVANAHALLI - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:05-07-2026 12:00:23.626 Relay PICKUP, Diff picked up

	Relay TRIP, Diff TRIP, Diff TRIP L1, Diff> TRIP >BrkFail extSRC BF T1-TRIP(loc) BF T2-TRIP(bus) >Trig.Wave.Cap. Ir (max): 0.67 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 0.05 kV Vy (max): 0.06 kV Vb (max): 0.09 kV
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12. A) PMU Analysis:



From PMU data, no fault was observed during the event

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
KPTCL	1. Non following of proper precautions during testing leading to the 400kV Bus-2 outage needs review 2. Tripping of tie breaker of ICT-3 at DEVANAHALLI during LBB operation in 400kV Bus-2 needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:05-07-2026 12:32

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	KPTCL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	KPTCL
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	KPTCL
4	Any other non-compliance	IEGC section 17.3	KPTCL

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
05-07-2026 13:23:39	DEVANAHALLI CB TIE 14 - CB 41452 OPEN	DVNHL_KA
05-07-2026 13:23:39	DEVANAHALLI CB 20852 (T2_S) OPEN	DVNHL_KA
05-07-2026 13:23:39	DEVANAHALLI CB TIE 13 - CB 41352 OPEN	DVNHL_KA
05-07-2026 13:23:39	DEVANAHALLI CB TIE 06 - CB 40652 CLOSED	DVNHL_KA
05-07-2026 13:23:39	DEVANAHALLI CB TIE 05 - CB 40552 CLOSED	DVNHL_KA
05-07-2026 13:41:33	DEVANAHALLI CB 20852 (T2_S) CLOSED	DVNHL_KA
05-07-2026 13:43:06	DEVANAHALLI CB 20852 (T2_S) OPEN	DVNHL_KA
05-07-2026 13:45:06	DEVANAHALLI CB 20852 (T2_S) CLOSED	DVNHL_KA
05-07-2026 13:46:23	DEVANAHALLI CB 20852 (T2_S) OPEN	DVNHL_KA

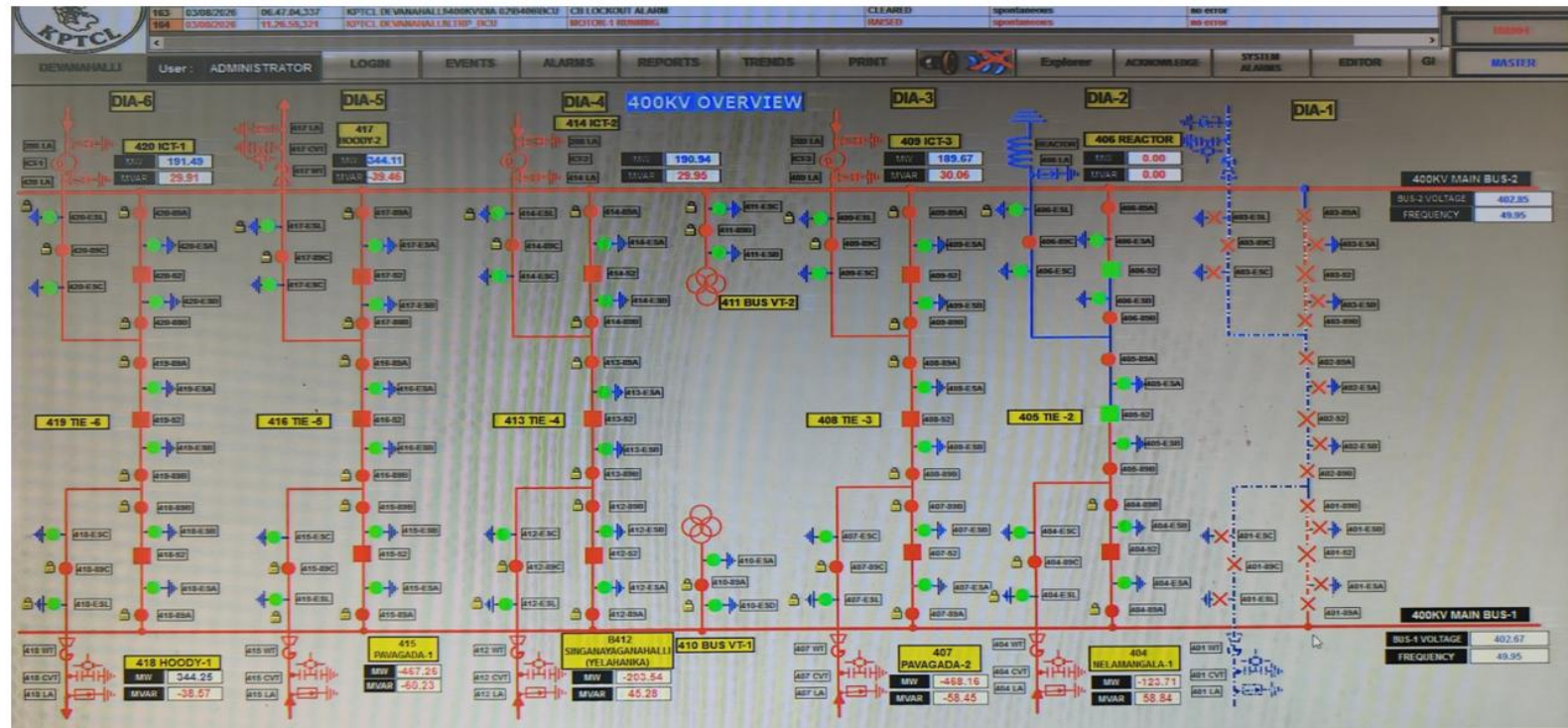
Deliberations:

1. KPTCL stated that in the antecedent conditions Bus Configuration at 400kV Devanahally Hardware Park Substation:

400kV Main Bus-1: 400kV lines Nelamangala, Pavagada line-2, Yelahanka, Pavagada line-1 and Hoody line-2;

400kV Main Bus-2: 125MVAR Bus Reactor, 500MVA ICT-3, ICT-2, Hoody Line-2 and ICT-1;

Elements under Scheduled Outage: ICT-2, 400kV Main & Tie CBs (414 & 413) were kept open due to scheduled outage availed for maintenance work. All other main CBs and Tie CBs were in closed condition.



2. KPTCL stated that on 05-07-2026 at 12:03 Hrs; Restoration time: 05-07-2026 12:32 Hrs. Main and Tie CBs of 500 MVA ICT-2 were kept open due to scheduled outage taken for regular maintenance works. While testing the differential relay of ICT-2, LBB operated and tripping was extended to all the Main CBs of 400KV Bus-2. Tie CB of ICT-3 also tripped during the incident resulting in outage of 500MVA ICT-3, however no load was affected since ICT-1 and 3 were operating in parallel.
3. **Remedial Measures taken Details:**
 - At Devanahally, LBB is enabled through the main protection relays of individual relays. Directions have been given to the concerned testing team to take appropriate measures while carrying out testing of relays during switchyard in live condition. SOP to be followed and adequate checks to prevent

spurious trippings to be ensured.

- 500MVA ICT-3 bay at Devanahally is recently commissioned, circuitry problem causing LBB tripping to Tie CB has been identified. Outage has been requested to carry out the wiring modifications

4. SRPC requested KPTCL for strict adherence to SOP to avoid such incidents.

Recommendation:

✚ ***KPTCL to strictly adhere to SOP during testing and maintainance activities.***

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
7	Tripping of 220kV Bus-1 & Bus-3 of 220kV Pothencode SS of KSEB	As per the reports submitted, the triggering incident is Y-G fault caused by flashover of Y-phase tension insulator of 220kV Bus-1 (near 220KV-TRIVANDRUM-POTHENCODE-1 feeder). This resulted in the operation of busbar differential protection and tripped all elements connected to 220kV Bus-1 (including Bus-3 which is permanently coupled to Bus-1) of POTHENCODE SS of KSEB. 110kV was in service during the event. Therefore, no load loss is observed.	05-07-2026 17:00	0	0	GI-1	20-07-2026	13-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, the triggering incident is Y-G fault caused by flashover of Y-phase tension insulator of 220kV Bus-1 (near 220KV-TRIVANDRUM-POTHENCODE-1 feeder). This resulted in the operation of busbar differential protection and tripped all elements connected to 220kV Bus-1 (including Bus-3 which is permanently coupled to Bus-1) of POTHENCODE SS of KSEB. 110kV was in service during the event. Therefore no load loss is observed.

2. Time and Date of the Event (घटना का समय और दिनांक): 05-07-2026 17:00

3. Event Category (ग्रिड घटना का प्रकार): GI-1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): KERALA

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Kerala State Demand (MW)	2925	2917

Kerala State Generation (MW)	545	541
Grid Frequency (Hz)	49.89	49.91
SR Demand (MW)	44394	44013
SR Generation (MW)	48525	48483

****Pre and post data of 1 minute before and after the event***

Elements under outage	
Weather Condition (मौसम स्थिति)	Cloudy

Bus configuration during antecedant condition :

Bus-1 :

1. 220KV-TRIVANDRUM-POTHENCODE-1
2. 220KV-TRIVANDRUM-POTHENCODE-3
3. 220KV-POTHENCODE-NEW KATTAKADA
4. 220KV-EDAMON-POTHENCODE-2
5. 200MVA 220/110KV TRANSFORMER-1 (UNDER PERMIT TO WORK CONDITION)
6. 200MVA 220/110KV TRANSFORMER-3
7. 220kV Bus-3

Bus-2 :

1. 200MVA 220/110KV TRANSFORMER-2
2. 220KV-TRIVANDRUM-POTHENCODE-2
3. 220KV-EDAMON-POTHENCODE-1

6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.0 MW

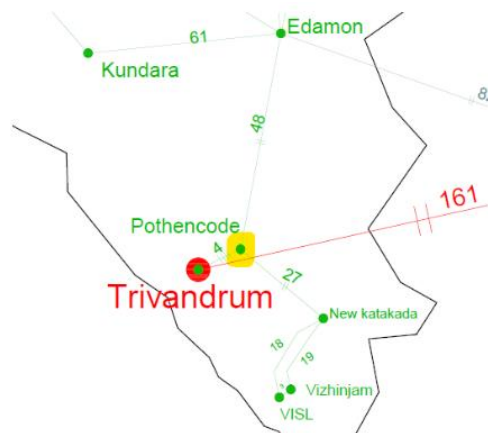
7. Duration of interruption (रुकावट की अवधि): 1 hours, 20 minutes

8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-POTHENCODE-TRIVANDRUM-3
2. 220KV-POTHENCODE-TRIVANDRUM-1
3. 220KV-EDAMON-POTHENCODE-2
4. 220KV-POTHENCODE-NEWKATAKADA-1
5. POTHENCODE - 220KV - Bus 1
6. POTHENCODE - 220KV - Bus 3

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):



As per the reports submitted, the triggering incident is Y-G fault caused by flashover of Y-phase tension insulator of 220kV Bus-1 (near 220KV-TRIVANDRUM-POTHENCODE-1 feeder). This resulted in the operation of busbar differential protection and tripped all elements connected to 220kV Bus-1 (including Bus-3 which is permanently coupled to Bus-1) of POTHENCODE SS of KSEB. 110kV was in service during the event. Therefore no load loss is observed.

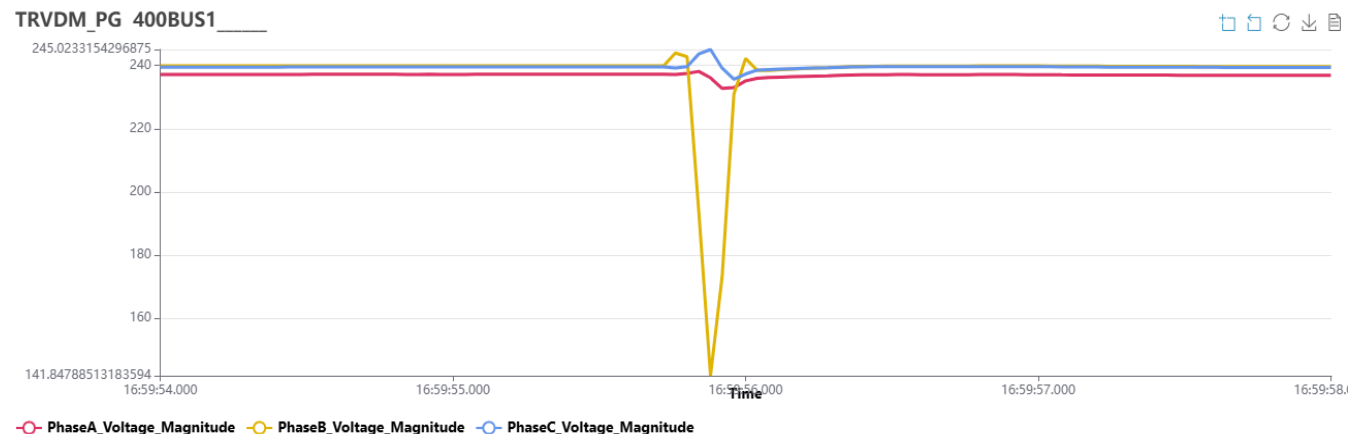
11. DR Analysis:

POTHENCODE - 220KV

	POTHENCODE - 220KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:05-07-2026 16:59:49.143 Trp 87BB Zone 01, Trp 87BB Zone 03, Flt 87BB Zone 01, Fault phase B, ZONE - A OPTD, Trip 87BB Ir (max): 0.03 kA Iy (max): 18.79 kA Ib (max): 0.06 kA

	DR Trigger Time:05-07-0026 16:59:49.140 Internal Trip, Trip 87BB, TO TRIP TC1 PH A, TO TRIP TC1 PH B, TO TRIP TC1 PH C, TO OPT 86X1, TO REM. END TRIP Ir (max): 0.49 kA Iy (max): 5.39 kA Ib (max): 0.42 kA
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12. A) PMU Analysis:



From the PMU plot, Y-G fault can be observed without any delayed fault clearance.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
KSEB	1. SS.

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
KSEB	220KV TRIVANDRUMPOTHENCODE #1 & #3 FEEDER CHARGED AT 18:10HRS AND 18:11HRS RESPECTIVELY

	220KV EDAMON POTHENCODE #2 FEEDER CHARGED AT 17:51HRS 200MVA 220/110KV TRANSFORMER #3 CHARGED AT 17:53HRS 220KV POTHENCODE NEW KATTAKADA FEEDER CHARGED AT 18:20HRS
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15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

1. 220KV-TRIVANDRUM-POTHENCODE-1 charged at 18:10 hrs
220KV-TRIVANDRUM-POTHENCODE-3 charged at 18:11 hrs
220KV-EDAMON-POTHENCODE-2 charged at 17:51 hrs
200MVA 220/110KV TRANSFORMER 3 charged at 17:53 hrs
220KV-POTHENCODE-NEW KATTAKADA charged at 18:20 hrs

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl.No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	KSEB
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	KSEB
4	Any other non-compliance	IEGC section 17.3	KSEB

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

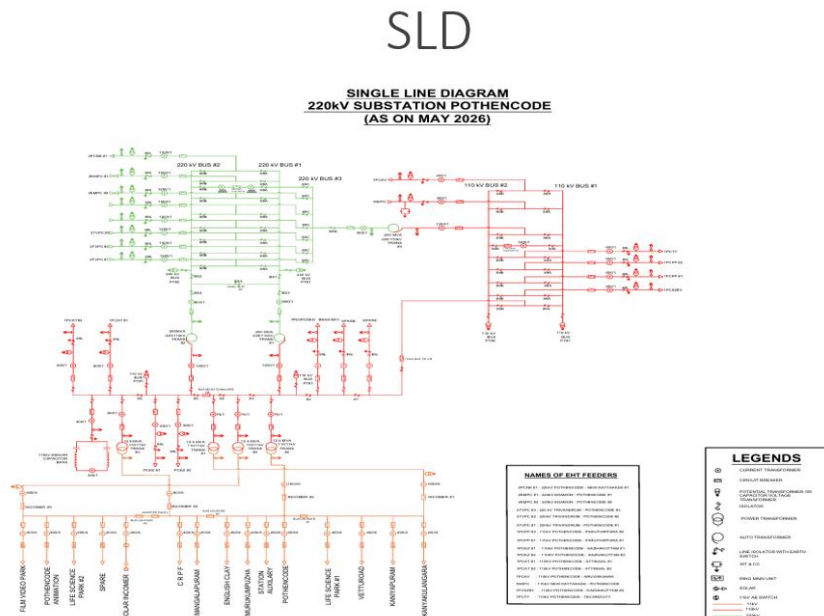
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
05-07-2026 17:00:11	POTHENCODE CB 20152 (LINE-1 TO KKDA2) OPEN	PCOD2_KL
05-07-2026 17:00:11	POTHENCODE CB 20752 (LINE-3 TO TRVDM) OPEN	PCOD2_KL
05-07-2026 17:00:11	POTHENCODE CB COUPLER CB 20352 OPEN	PCOD2_KL
05-07-2026 17:00:11	POTHENCODE CB 20452 (LINE-2 TO EMON2) OPEN	PCOD2_KL

Deliberations:

1. KSEBL presented the BUS configuration in the antecedent conditions :



2. KSEBL stated that a Grid Incident of 220kV Busbar operation resulting in a partial outage of 220 kV Substation Pothencode occurred on 05.07.2026 at 16:59 hrs. The incident was initiated by the flashover of the Y-phase tension insulator of 220 kV Bus #1, located near the 220 kV Trivandrum–Pothencode #1 feeder bay, flashed over at 220 kV Pothencode Substation.
3. The fault resulted in the operation of the 220 kV Bus Bar Protection Scheme (Bus bar Zone 1) at Pothencode Substation and subsequent tripping of all connected transmission elements, causing a partial outage of the substation.
4. KSEBL stated that the operation of the 220 kV Busbar Protection was found to be correct. The fault occurred in the vicinity of the 220 kV PGCIL Trivandrum Pothencode No. 1 feeder due to the flashover of the Y phase tension insulator. Since the fault was located within the protection boundary of 220 kV Busbar Zone 1, the Busbar Protection correctly identified the fault and tripped all the elements connected to the affected zone, thereby successfully clearing the fault.
5. Busbar Zone 3 is an extension of Zone 1 – It also operated. On the 110 kV side, the 200 MVA ICTs are operated in parallel. Consequently, no load interruption was experienced, as the load was automatically transferred to the healthy transformer following the isolation of the faulted bus section.
6. MS, SRPC suggested KSEBL to perform regular thermovision scanning of switchyard to identify any hot spots. KSEBL stated that they are performing regular Thermovision scanning but no abnormalities are found.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
8	Tripping of 400kV Bus-2 at NNTPP of NLC	As per the reports submitted, SF6 interlock testing on the 400 kV GT-2 bay at NNTPP a false busbar trip was triggered due to a relay mapping error, which cause opening of 400 kV Bus-2 and all connected elements (400KV/230KV NNTPP-ICT-2, Bus Coupler, 400KV-NNTPP-PUDUCHERRY-1, and 400KV-ARIYALUR-NNTPP-2 lines). After which the loading in ICT-1 increased and tripped due to overcurrent protection. This led to the Tripping of 400kV Bus-2 at NNTPP of NLC.	10-07-2026 13:02	0	0	GI-2	23-07-2026	16-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, SF6 interlock testing on the 400 kV GT-2 bay at NNTPP a false busbar trip was triggered due to a relay mapping error, which cause opening of 400 kV Bus-2 and all connected elements (400KV/230KV NNTPP-ICT-2, Bus Coupler, 400KV-NNTPP-PUDUCHERRY-1, and 400KV-ARIYALUR-NNTPP-2 lines). After which the loading in ICT-1 increased and tripped due to overcurrent protection. This led to the Tripping of 400kV Bus-2 at NNTPP of NLC.

2. Time and Date of the Event (घटना का समय और दिनांक): 10-07-2026 13:02

3. Event Category (ग्रिड घटना का प्रकार): GI-2

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): TAMILNADU , PONDICHERRY

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
-----------	------------------------	--------------------------

Pondicherry State Demand (MW)	450	449
Pondicherry State Generation (MW)	0	0
TamilNadu State Demand (MW)	18520	18540
TamilNadu State Generation (MW)	14911	14903
Grid Frequency (Hz)	50.03	50.02
SR Demand (MW)	63852	63599
SR Generation (MW)	53625	53426

**Pre and post data of 1 minute before and after the event*

Elements under outage	1. 400KV/21KV NNTPP-GT-2
Weather Condition (मौसम स्थिति)	Normal

Bus split operation at 230kV NLC-TNEB and 230kV Cuddalore due to power regulation:

At 230kV NLC-TNEB:

Bus -A:230kV NNTPP 1&2, 230kV Cuddalore, 230kV Shankarapuram

Bus -B: 230kV NLC TS2 1&2,230kV Kadalangudy, 230kV Eachangadu

At 230kV Cuddalore:

Bus -B: 230kV STCMS, PTRs, 230kV Ulundurpet

Bus -A: 230kV NLC-TNEB, Villupuram

230kV NNTPP-NLC TS 2 Lines 1 & 2 under idle charged condition from NLC TS for power regulation

230kV Shankapuram-Ulundarpet open condition for power regulation

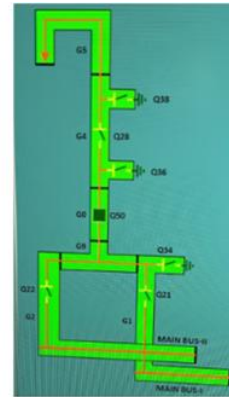
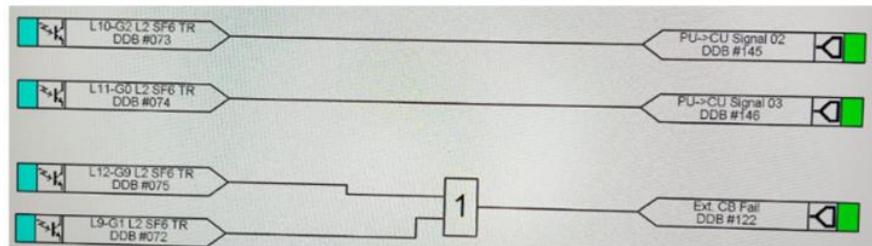
230kV Cuddalore-Veerapuram DC under idle charged condition

Bus Connectivity at 400kV NNTPP :

Bus 1 Connected Elements	Bus 2 Connected Elements	
1. 400KV/21KV NNTPP-GT-1 2. 400KV/230KV NNTPP-ICT-1 3. 400KV-SALEM-NNTPP-1 4. 400KV-ARIYALUR-NNTPP-1	1. 400KV/21KV NNTPP-GT-2 2. 400KV-ARIYALUR-NNTPP-2 3. 400KV/230KV NNTPP-ICT-2 4. 400KV-NNTPP-PUDUCHERRY-1	I

6. Load and Generation loss (लोड और जेनरेशन हानि):

In the antecedent conditions, due to Bus split and idle charging of the lines on power regulation, the connectivity at NNTPP is as shown above, where in the region in yellow is being fed through NNTPP ICTs and each ICT was loading around 360MVA (around 76%) each. As per the reports submitted, during the testing of SF6 gas pressure interlock checks in 400 kV GT-2 (G0) bay at NNTPP during SAS upgrade works, during which due to a logic mapping error in the GT-2 bay relay, where in the feedback which has to be sent as LBB initiation (External CB Fail) but sent the signal to BBP CUB as BBP operation as shown below.



Hence due to the BBP operated in 400kV Bus-2 and all the elements connected to Bus-2 (400 kV NNTPS–Ariyalur-2 feeder, 400 kV NNTPS–Pondy feeder, ICT-2, and the 400 kV Bus Coupler).

Relay pickup current (A)

840

Fault current (A)

995

Time multiplier (TMS) / Time dial setting (TDS)

0.21

Select curve equation

☒ IEC Standard 60255

☐ IEEE Standard C37.112

☐ Electromechanical IAC

☐ Rapid Inverse (RI)

Curve Type

Standard Inverse Time

Calculate

Ratio of fault current to pickup current

1.18

Tripping time at fault current (s)

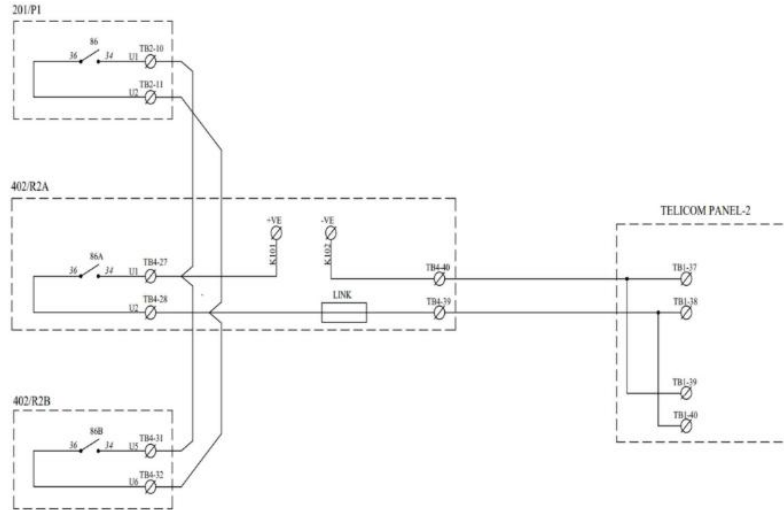
8.87

With the tripping of the ICT-2, the power shifted to ICT-1 and the 400/220kV ICT started loading to around 1000A (692 MVA, 1.38 times of MVA) and Over current protection operated after around 9s from the BBP operation which is matching with the settings of NNTPP ICT (840A pick up with 0.21 TMS)

In the event of tripping of any one 400/230kV ICT at NNTPP, the following 110kV lines are tripped for reducing the over loading

Contingency	Action
Tripping of one of 400/230 kV 2X250 MVA ICTs at NNTPP	Trip 110kV Neyveli-Vadakuthu feeder-max 70MW 110kV Neyveli-Aduthurai feeder-max 70MW 110kV Neyveli-Panruti feeder-max 25MW 110kV Sankarapuram-Deviakuruchi feeder-max 35MW 110kV Sankarapuram-Pudupattu feeder-max 38MW

However, it is to note that the SPS envisaged for the over loading of NNTPP did not operate during the event.



The Special Protection Scheme (SPS) failed to operate as the mapping was only through 86, and since BBP operated, the SPS failed to operate.



After the tripping of both the 400/220kV ICTs at NNTPP, the loading in 220kV Singarpur-Tiruvannamalai further increased and managed by TANTRANSCO before the restoration of 400/220kV NNTTP ICT-1.

This led to the Tripping of 400kV Bus-2 at NNTTP of NLC and there was no generation or load loss during the event

11. DR Analysis:

400KV-NNTTP-PUDUCHERRY-1

	NNTTP - 400KV	PUDUCHERRY - 400KV
Time Sync Issue	No	Yes
DR Analysis	DR Trigger Time:10-07-2026 13:03:42.269 Any Trip, Trip 50BF (CU), Internal Trip Trip Zone 2 L6-LBB INN 3PH L2-CB OPEN Any Trip, Trip 50BF (CU), Internal Trip	Line Holding

	Trip Zone 2 Ir (max): 0.80 kA Iy (max): 0.85 kA Ib (max): 0.82 kA	
--	---	--

400KV-ARIYALUR-NTTP-2

	NTTP - 400KV	ARIYALUR - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:10-07-2026 13:03:42.268 Any Trip, Trip 50BF (CU), Internal Trip Trip Zone 2 L6-LBB INN 3PH L2-CB OPEN Any Trip, Trip 50BF (CU), Internal Trip Trip Zone 2 Ir (max): 0.49 kA Iy (max): 0.55 kA Ib (max): 0.55 kA	Line Holding

400KV/230KV NTTP-ICT-2

	NTTP - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:10-07-2026 13:03:42.268 Any Trip, Trip 50BF (CU), Internal Trip Trip Zone 2 L4-LBB INN 3PH L2-CB OPEN Any Trip, Trip 50BF (CU), Internal Trip

	Trip Zone 2 Ir (max): 0.51 kA Iy (max): 0.52 kA Ib (max): 0.51 kA
--	--

400KV/230KV NNTPP-ICT-1

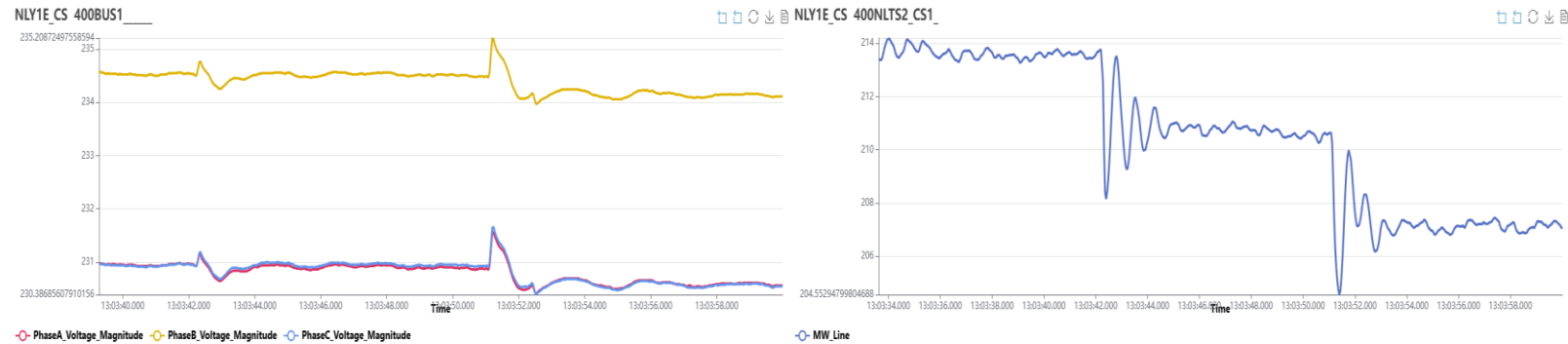
	NNTPP - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:10-07-2026 13:03:42.336 Any Start, I>1 Start A, I>1 Start B, I>1 Start C Ir (max): 1.00 kA Iy (max): 1.02 kA Ib (max): 1.01 kA Vr (max): 234.93 kV Vy (max): 235.29 kV Vb (max): 236.22 kV DR Trigger Time:10-07-2026 13:03:51.118 Trip Command In, I>1 Trip Ir (max): 0.98 kA Iy (max): 1.00 kA Ib (max): 1.00 kA Vr (max): 241.47 kV Vy (max): 241.42 kV Vb (max): 241.04 kV

NNTPP - 400KV

	NNTPP - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:10-07-2026 13:03:42.268 Trip 50BF Zone 2 Trip 50BF Zone 2 Ir (max): 0.04 kA Iy (max): 0.04 kA Ib (max): 0.05 kA DR Trigger Time:10-07-2026 13:03:42.270 L11-G0 L2 SF6 TR Trip 50BF (CU) Trip Zone 2 L4-LBB INN 3PH L15-LBB INN EXT

L11-G0 L2 SF6 TR
 Trip 50BF (CU)
 Trip Zone 2
 Ir (max): 0.01 kA Iy (max): 0.01 kA Ib (max): 0.01 kA

12. A) PMU Analysis:



From PMU, no fault is observed during the event.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
NLC	- BBP protection operation due to PSL logic issue during the GD testing needs review - Non operation of SPS during ICT tripping needs review (logic of only inclusion of 86 may be reviewed)

14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

15. RLDC Analysis/Observations (Based on Simulation Studies): NA

16. Restoration Details:

ICT-1 was charged at 13:09 hrs,

Bus Coupler was closed at 13:50 hrs

ICT-2 was charged at 13:51 hrs

the 400 kV , the 400 kV NNTPS–Pondy feeder was charged at 14:16 hrs

400 kV NNTPS–Ariyalur-2 feeder was charged at 14:28 hrs

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl. No	Issues	Regulation Non-Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	NLC
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	PGCIL SR-2, TANTRANSCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

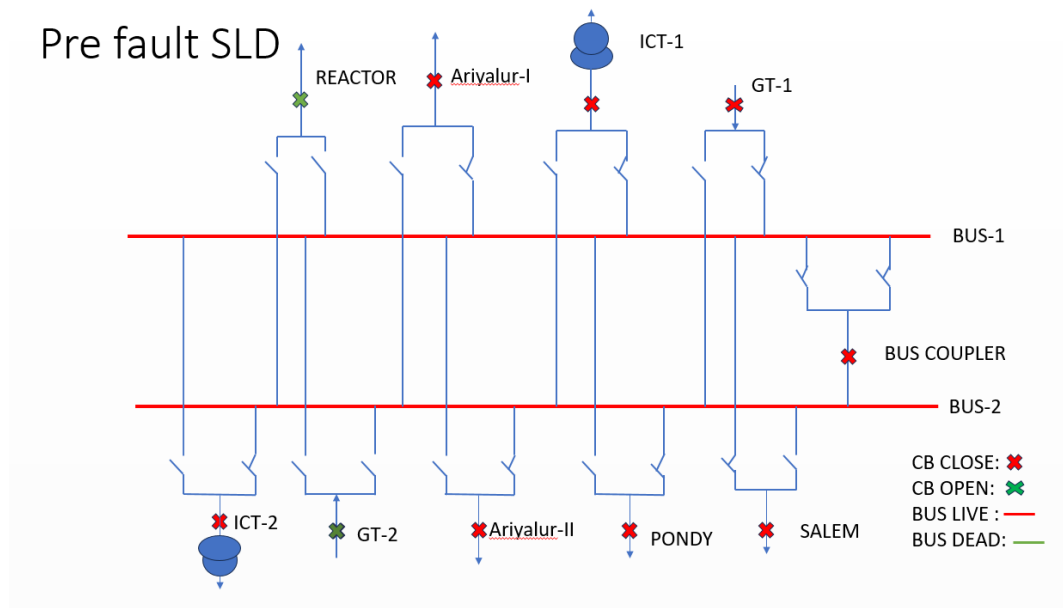
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
10-07-2026 13:03:47	NEYVELI NEW TPP CB 40952 (LINE-2 TO ARYR7) OPEN	NNTPP_CS
10-07-2026 13:03:47	NEYVELI NEW TPP CB 41052 (LINE TO PONDY) OPEN	NNTPP_CS
10-07-2026 13:03:47	NEYVELI NEW TPP CB 20252 (T2_S) OPEN	NNTPP_CS
10-07-2026 13:03:47	NEYVELI NEW TPP CB 40152 (T2_P) OPEN	NNTPP_CS
10-07-2026 13:03:47	NEYVELI NEW TPP CB COUPLER CB 40752 OPEN	NNTPP_CS

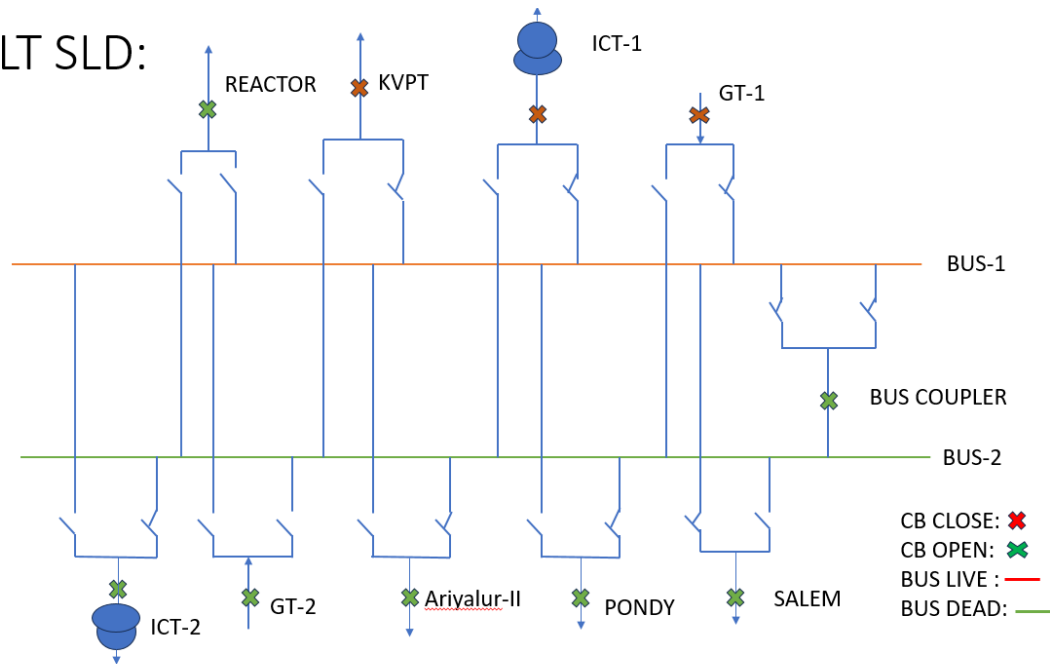
Deliberations:

1. NNTPS stated that in antecedent consitions Unit-2 is in shutdown condition, and BUS reactor is not in service.SAS upgradation works under progress.
 - ICT-1,Ariyalur-I & GT-1 are connected to BUS-1
 - ICT-2, Ariyalur-II, SALEM, PONDY are connected to BUS-2.
 - ICT-1 & ICT-2 are loaded by each 268MW
 - Weather Condition is normal



2. NNTPS stated that At 13:03hrs on 10-07-2026 bus-2 cleared due to bus bar protection During the SAS upgradation works in the 400 kV GT-2 bay, SF6 gas pressure interlocks were being checked in the G0 compartment (Circuit Breaker compartment).
3. While carrying out the pressure interlock testing, a busbar trip command was inadvertently generated from the CUB relay upon receiving a signal from the PUB relay of the GT-2 bay, resulting in the tripping and clearance of 400 kV Bus-2
4. The feeders (ICT-2, Pondy & Ariyalur-II) which are connected to BUS-2 are tripped and BUS coupler tripped.Following the tripping of ICT-2, its entire load was transferred to ICT-1. Due to the sudden increase in loading, ICT-1 became overloaded and subsequently tripped. The cascading tripping resulted in the complete blackout of the 220 kV system.

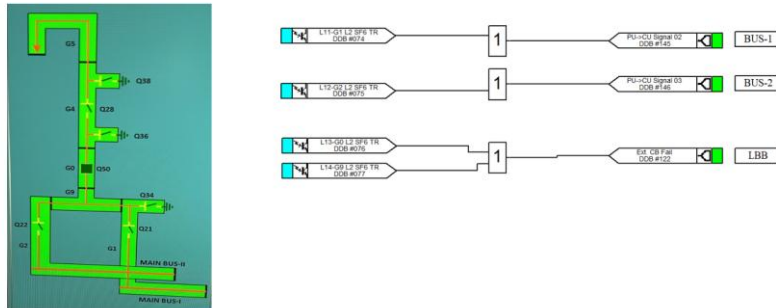
FAULT SLD:



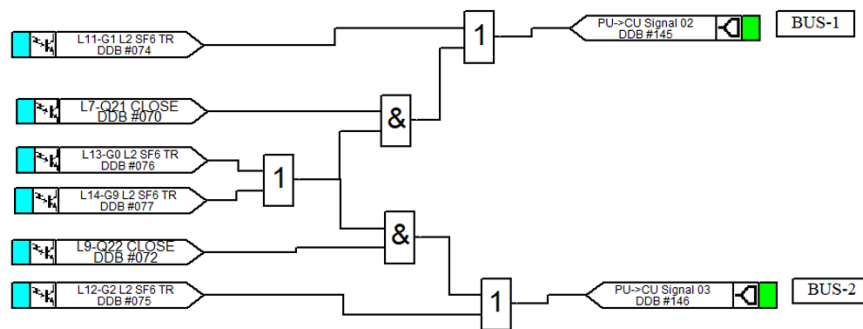
5. Remedial action taken :

- Checked the relay events and DR it was found that G0 compartment SF6 L2 trip signal is wrongly mapped.
- PSL logic was modified and system restored in both 400 & 220kV.
- ICT-2 tripped due to Busbar Protection operation through the 96 Lockout Relay. Since the 96 Lockout Relay contact was not incorporated in the existing SPS logic, the SPS scheme did not operate following the ICT-2 trip.
- Consequently, the required load shedding was not initiated, resulting in the entire load of ICT-2 being transferred to ICT-1.
- The sudden increase in loading caused ICT-1 to become overloaded and subsequently trip, leading to a cascading disturbance and blackout of the 220 kV system
- In Modified SPS scheme, 96 relay contacts and breaker open contacts also considered.
- SPS system wiring modifications will be completed during the upcoming ICT shutdown planned for SAS upgradation works

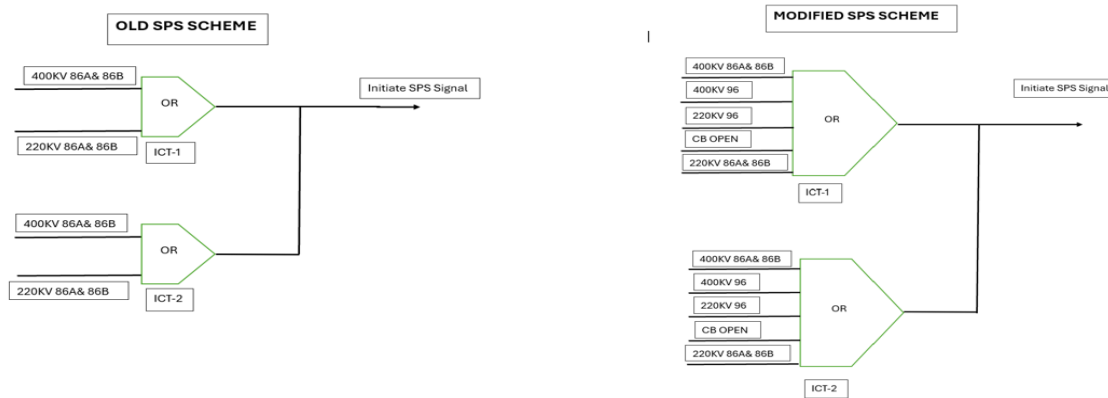
Old PSL Logic in GT-2 PUB Relay & GIS View



Modified PSL Logic



SPS SCHEME



- SRPC enquired whether the SPS operation is verified after logic change. NNTPS stated that the SPS system wiring modifications will be completed during the upcoming ICT shutdown planned for SAS upgradation works and will update the forum after completion.
6. SRPC requested NNTPS for strict adherence to SOP during testing and maintainance activities.

Recommendations:

NNTPS to strictly adhere to SOP during testing and maintainance works.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
9	Tripping of 220kV Bus-1 and 2 at Vemagiri(AP) of APTRANSCO	As per the submitted reports, an R-G fault on the Bommuru-GVK feeder resulted in an unsuccessful AR at the Bommuru end. Heavy fault current contributed by the Vemagiri 220kV bus caused a quad moose jumper in the Bus Coupler Bay to disconnect from its CT stud and fall onto a post-insulator structure. This created an R-phase bus fault, triggering 220kV busbar protection that tripped both Bus-1 and Bus-2 along with all connected elements, due to this power diverted through Guddigudem SS and overloaded ICT-1 and ICT-2, causing both transformers to trip on 3-phase overcurrent protection.	16-07-2026 11:52	0	1150	GI-1	28-07-2026	21-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the submitted reports, the triggering incident was R-G fault in 220kV Vemagiri Bus coupler. Immediately, 220kV Bus-1 & Bus-2 BBP operated tripping all elements connected to the bus including Vemagiri ICTs. This led to tripping of 220kV Bus-1 & Bus-2 of 220kV Vemagiri_AP. Tripping of the ICTs led to over loading of 400kV/220kV Guddigudem ICT-1 & 2 and the ICTs tripped on overloading.

2. Time and Date of the Event (घटना का समय और दिनांक): 16-07-2026 11:52

3. Event Category (ग्रिड घटना का प्रकार): GI-1

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): ANDHRA PRADESH

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Andhra Pradesh State Demand (MW)	14414	14329
Andhra Pradesh State Generation (MW)	9513	9506
Grid Frequency (Hz)	49.99	50.0
SR Demand (MW)	71995	72011
SR Generation (MW)	63066	63030

**Pre and post data of 1 minute before and after the event*

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

In the antecedent condition, at 400/220kV Vemagiri SS, 220kV Bus bar scheme is Double bus with Transfer bus coupler scheme.

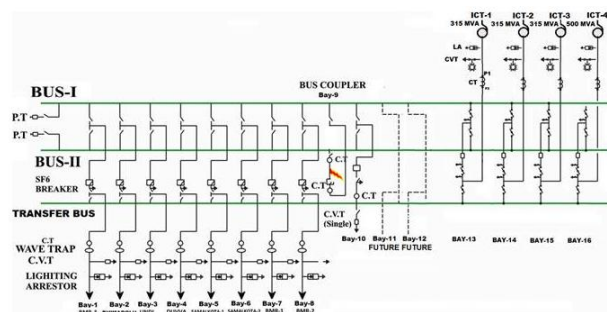
At 400/220kV SS, Vemagiri, 220kV elements were connected in the the following manner.

Bus-1: Undi, Duvva, Samarlakota-1&2, 315 MVA ICT-1,2 &3.

Bus-2: Bommuru-1,2,3 , Bhimadolu and 500MVA ICT-4.

Bus coupler was in closed condition.

The SLD of Vemagiri station is shown below



6. Load and Generation loss (लोड और जेनरेशन हानि):

Generation Loss (MW)	Load Loss (MW)
0.0 MW	1150.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 14 minutes

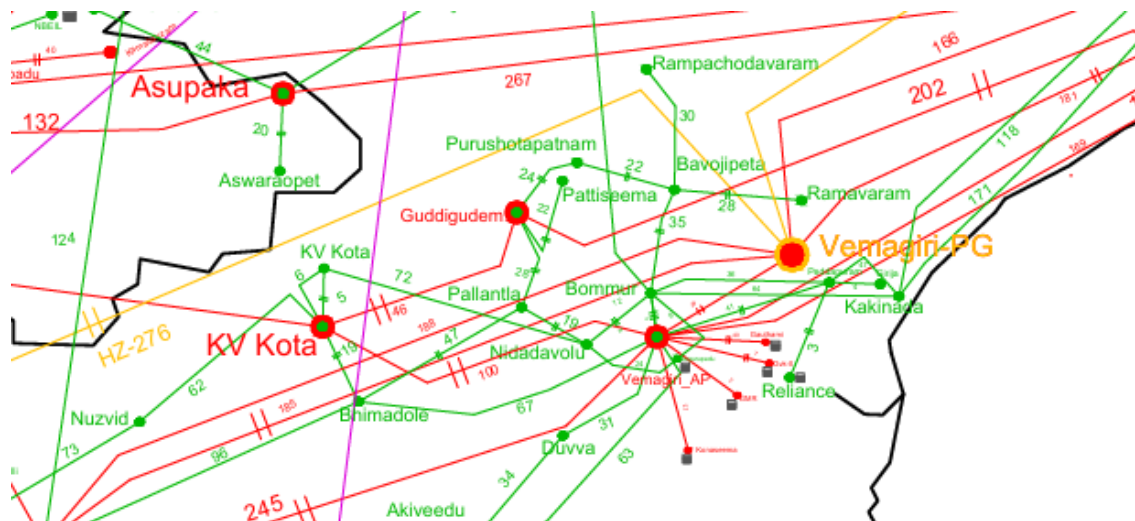
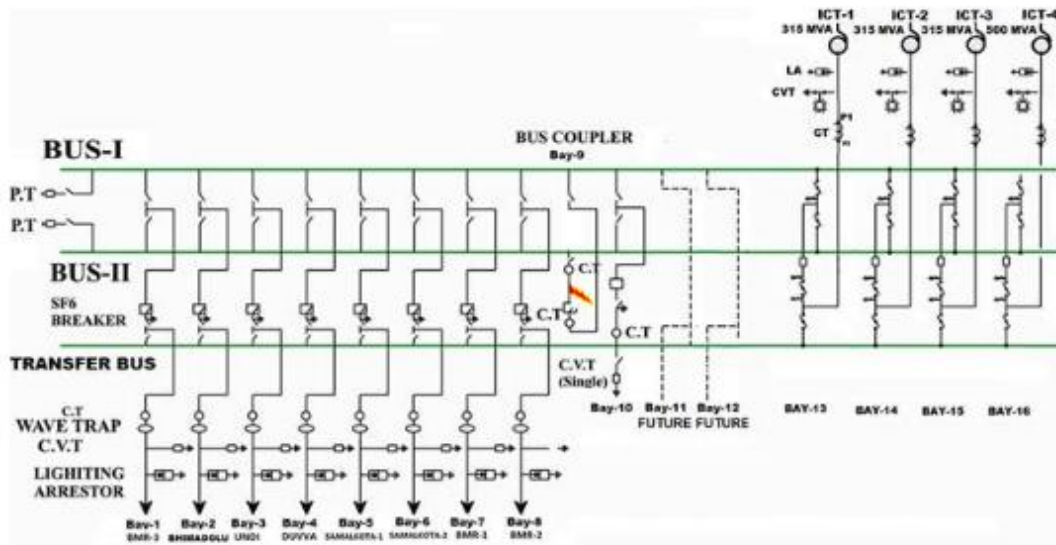
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV/220KV VEMAGIRI_AP-ICT-1
2. 400KV/220KV VEMAGIRI_AP-ICT-2
3. 400KV/220KV VEMAGIRI_AP-ICT-3
4. 400KV/220KV VEMAGIRI_AP-ICT-4
5. 400KV/220KV GUDDIGUDEM-ICT-1
6. 400KV/220KV GUDDIGUDEM-ICT-2

10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

As per the submitted reports, the triggering incident was an R-G fault on the 220 kV Bommuru–GVK feeder at 11:52.13hrs . At Bommuru end, the fault was sensed in zone-1 with a fault current of 21kA. A/R operated and was unsuccessful. During the fault, a major portion of the fault current was contributed by the Vemagiri 220 kV bus through the 220 kV Vemagiri Bommuru Line-1 Line-2, and Line-3 feeders. Consequently, at 11:52:49hrs, the quad moose jumper between the CB and the Bus-2 CT in the 220 kV Bus Coupler bay of 220kV Vemagiri SS became disconnected from the CT stud along with its metal clamp and fell onto the supporting structure of the post-type insulator, resulting in an R-phase bus fault. As a consequence, the 220 kV BBP operated, tripping both Bus-1 and Bus-2 along with all the elements connected to the respective bus sections including 400kV/220kV Vemagiri ICT-1,2,3&4. This led to tripping of 220kV Bus-1 & Bus-2 of 220kV Vemagiri SS.



Tripping of the Vemagiri ICTs led to over loading of 400kV/220kV Guddigudem ICT-1 and ICT-2, which subsequently tripped on three-phase overcurrent protection.

However as per the SPS implemented at Vemagiri, it was reported that an intentional time delay of 1min is set for tripping of Guddigudem ICTs on over loading. As per the EL of the Guddigudem ICTs, ICTs got over loaded for 28s after tripping of Vemagiri ICTs and tripped on HV side over current protection before SPS could operate.

Contingency	Action
In the event of tripping of 500 MVA ICT-4 at 400/220 kV Vemagiri SS	Open 220 kV Bus Coupler at 400/220 kV Vemagiri SS
After the occurrence of the above event, if the sum of loading on ICTs at 400/220 kV Kota SS exceeds their respective rated MVA (thermal limit)	Trip LVs of 132/33 kV Bhimadole PTRs, 132/33 kV Pedavegi PTRs, and 132/33 kV Nallajerla PTRs(Expected total load relief $\approx$ 100 MW)
After the occurrence of the above event, if the sum of loading on ICTs at 400/220 kV Guddigudem SS exceeds their respective rated MVA (thermal limit)	Load relief at 220kV Nidadavolu by tripping LV Side of Nidadavole & Kovvur SS(Expected total load relief $\approx$ 50 MW)

11. DR Analysis:

400KV/220KV VEMAGIRI_AP-ICT-1

	VEMAGIRI_AP - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:16-07-2026 11:52:49.448 X7_BI5: BB OPTD(DR) IEDStartup X7_BI2: CB OPEN Ir (max): 0.01 kA Iy (max): 0.01 kA Ib (max): 0.00 kA Vr (max): 238.59 kV Vy (max): 245.17 kV Vb (max): 233.51 kV

400KV/220KV VEMAGIRI_AP-ICT-2

	VEMAGIRI_AP - 400KV
Time Sync Issue	No

DR Analysis	DR Trigger Time:16-07-2026 11:52:49.448 X7_BI5: BB OPTD(DR) IEDStartup X7_BI1: CB CLOSE Ir (max): 0.01 kA Iy (max): 0.01 kA Ib (max): 0.01 kA Vr (max): 237.98 kV Vy (max): 245.19 kV Vb (max): 232.54 kV
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400KV/220KV VEMAGIRI_AP-ICT-3

	VEMAGIRI_AP - 400KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:16-07-2026 11:52:49.448 X9_BI3: BB OPTD(DR) IEDStartup Ir (max): 0.01 kA Iy (max): 0.00 kA Ib (max): 0.01 kA Vr (max): 127.65 kV Vy (max): 134.88 kV Vb (max): 127.84 kV

400KV/220KV VEMAGIRI_AP-ICT-4

	VEMAGIRI_AP - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:16-07-2026 11:52:49.526 IEDStartup Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 87.95 kV Vy (max): 117.36 kV Vb (max): 111.99 kV

400KV/220KV GUDDIGUDEM-ICT-1

	GUDDIGUEDEM - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:16-07-2026 11:53:17.449 OC ST-1 TRIP OCEF GENRL TR Ir (max): 1.09 kA Iy (max): 1.09 kA Ib (max): 1.09 kA Vr (max): 244.14 kV Vy (max): 246.79 kV Vb (max): 255.23 kV DR Trigger Time:16-07-2026 11:53:17.449 OC ST-1 TRIP OCEF GENRL TR Ir (max): 1.09 kA Iy (max): 1.09 kA Ib (max): 1.09 kA Vr (max): 244.14 kV Vy (max): 246.79 kV Vb (max): 255.23 kV

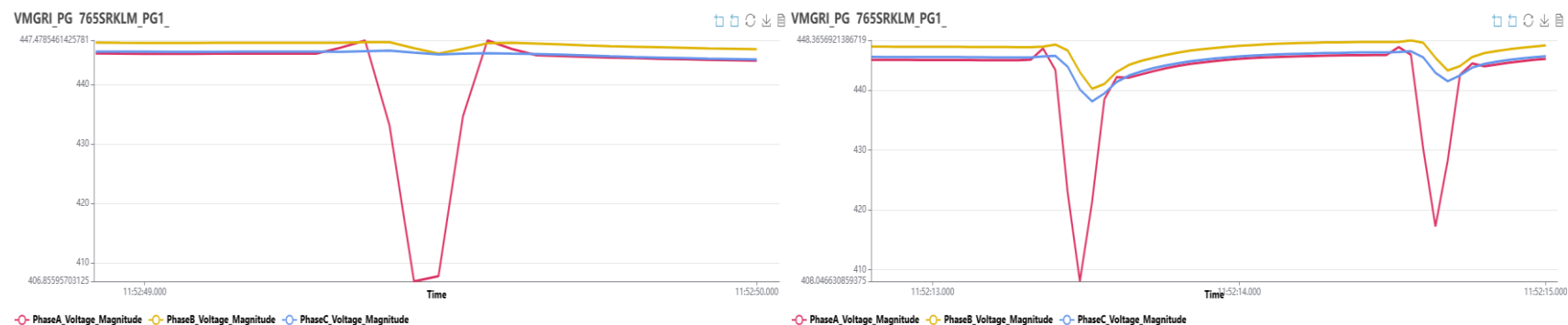
400KV/220KV GUDDIGUEDEM-ICT-2

	GUDDIGUEDEM - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:16-07-2026 12:52:54.527 OC TRIP, OC OL ALAM Ir (max): 0.66 kA Iy (max): 0.67 kA Ib (max): 0.66 kA Vr (max): 222.79 kV Vy (max): 226.61 kV Vb (max): 223.15 kV

VEMAGIRI_AP - 220KV

	VEMAGIRI_AP - 220KV
Time Sync Issue	No
DR Analysis	Loss of power supply to 220kV Bus-1& Bus-2

12. A) PMU Analysis:



From PMU plot, R-G fault is observed at 11:52:49hrs indicating R-G fault in 220kV Vemagiri Bus coupler.

At 11:52:13hrs, R-G fault is observed indicating R-G fault in 220kV Bommuru GVK line with unsuccessful A/R operation.

13. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

Constituent	Points for review
APTRANSCO	1. Non operation of SPS during overloading of Guddigudem ICTs needs review

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
APTRANSCO	The damaged jumper along with the clamp replaced with spare.

15. RLDC Analysis/Observations (Based on Simulation Studies):

NA

16. Restoration Details:

At Vemagiri SS, 220kV Bus-1 at 12:06 Hrs, Bus coupler at 15:45 Hrs and 220kV Bus-2 at 15:45 Hrs.

At Guddigudem SS, ICT-1 at 12:19 Hrs and ICT-2 at 12:21 Hrs.

17. Non-compliance observed (विनियमन का गैर-अनुपालन):

Sl No	Issues	Regulation Non- Compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु): NA

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
16-07-2026 11:53:22	GUDDIGUDEM 400 CB 21452 (T2_S) OPEN	GGDM4_AT
16-07-2026 11:53:22	GUDDIGUDEM 400 CB TIE 17 - CB 41752 OPEN	GGDM4_AT
16-07-2026 11:53:22	GUDDIGUDEM 400 CB TIE 14 - CB 41452 OPEN	GGDM4_AT
16-07-2026 11:53:22	GUDDIGUDEM 400 CB TIE 18 - CB 41852 OPEN	GGDM4_AT
16-07-2026 11:53:22	GUDDIGUDEM 400 CB TIE 15 - CB 41552 OPEN	GGDM4_AT
16-07-2026 11:53:23	GUDDIGUDEM 400 CB 22252 (LINE-2 TO PSPT2) OPEN	GGDM4_AT
16-07-2026 11:53:26	GUDDIGUDEM 400 CB 21352 (T1_S) OPEN	GGDM4_AT
16-07-2026 12:43:49	GUDDIGUDEM 400 CB TIE 18 - CB 41852 CLOSED	GGDM4_AT
16-07-2026 12:43:49	GUDDIGUDEM 400 CB TIE 14 - CB 41452 CLOSED	GGDM4_AT

time	Event	Location
16-07-2026 11:52:19	BOMMURU 220 CB 21352 (LINE TO JGRP2) OPEN	BMRU2_AT
16-07-2026 11:52:55	VEMAGIRI CB 20352 (LINE TO BVRM2) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 21552 (T3_S) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 21652 (T4_S) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 20152 (LINE-3 TO BMRU2) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 20652 (LINE-2 TO SMLK2) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 21352 (T1_S) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 20452 (LINE TO DUVA2) OPEN	VMGR4_AT
16-07-2026 11:52:55	VEMAGIRI CB 20752 (LINE-1 TO BMRU2) OPEN	VMGR4_AT

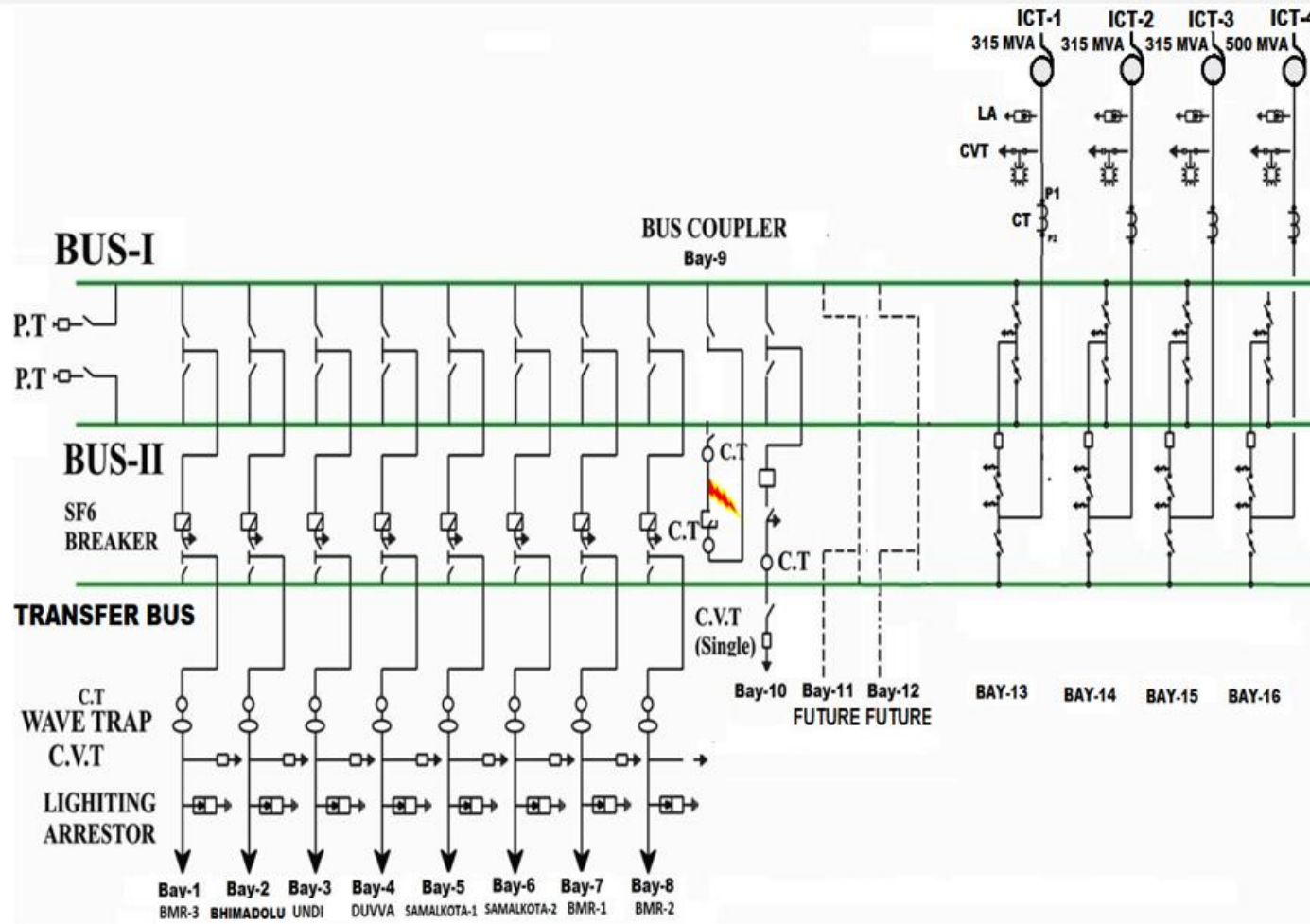
Deliberations:

1. APTRANSCO presented on the BUS configuration in the antecedent conditions.

Bus-1: Undi, Duvva, Samarlakota-1&2, ICT-1, 2, 3

Bus-2: Bommuru-1, 2, 3, Bhimadolu, ICT-4

FAULT LOCATION IN SLD OF 220kV VEMAGIRI SWITCH YARD



2. APTRANSCO stated that at 11:52:10.559 Hrs, R-Ph fault occurred in 220kV Bommuru-GVK feeder and AR was unsuccessful.
3. Further, at 11:52:49Hrs, R-G fault occurred (jumper between CB and Bus-2 CT of Bus coupler bay disconnected alongwith melted clamp and fell onto the bus post insulator support structure) in overlapping zone of both Bus-1 & 2.
4. For the above fault, Bus bar protection of 220kV Bus-1 & 220kV Bus-2 were operated and tripped all the connected elements. Consequent to the trippings of all the elements connected to 220kV Bus-1&2 at Vemagiri SS, load drawl (from 400kV grid) at 220kV level increased on ICTs at 400kV Guddigudem and 400kV Kota respectively. Subsequently, 400kV SS, Guddigudem SS, 315MVA ICT-1&2 were tripped on operation of HV side Over current protection due to increase in loads.
5. Remedial action taken: At 400/220kV Vemagiri SS, in 220kV Bus coupler bay, damaged jumper alongwith the clamp was replaced with spare on the same day.

Recommendations:

- ⬇ APTRANSCO to review the DR time synchronization issue at GUDDIGUDEM - 400KV
