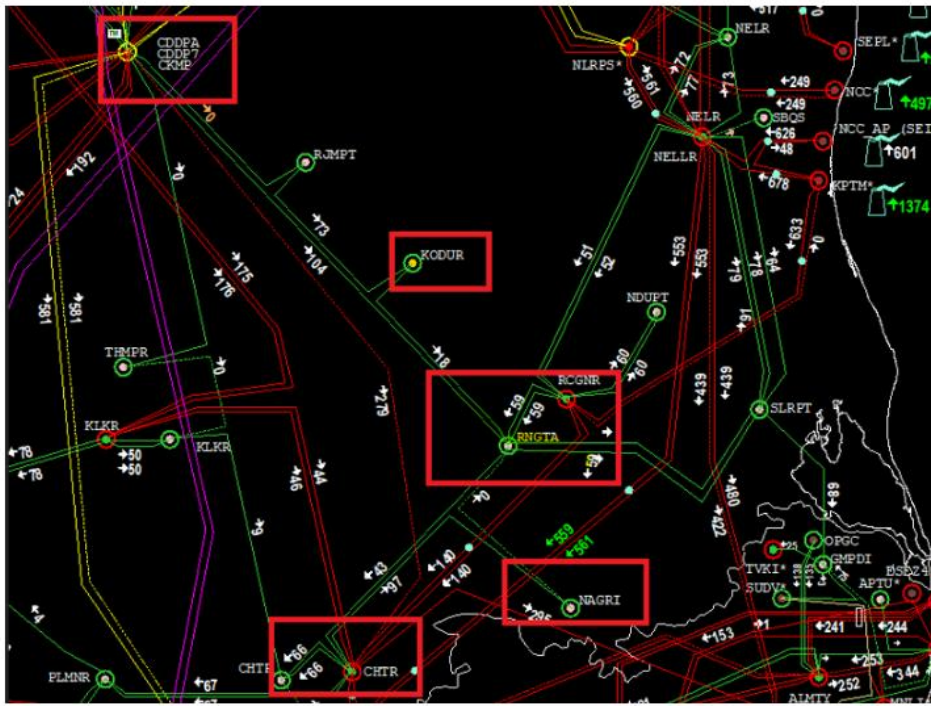


Grid Occurrences – 144

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 220kV Renigunta SS of APTRANSCO	As per the reports submitted, the triggering incident was R-Phase CT failure in 220kV Nagari Renigunta line at Renigunta SS which eventually became a 220kV Bus fault. 220kV BBP did not operate and all lines connected to 220kV Renigunta SS tripped from remote ends. This led to complete outage of 220kV Renigunta SS.	21-05-2026 22:49	0	250	GD - 1	13-06-2026	07-06-2026	Considered

[SLD of the affected Sub-station/Connectivity Diagram:](#)



Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, the triggering incident was R-Phase CT failure in 220kV Nagari Renigunta line at Renigunta SS which eventually became a 220kV Bus fault. 220kV BBP did not operate and all lines connected to 220kV Renigunta SS tripped from remote ends. This led to complete outage of 220kV Renigunta SS.

2. Time and Date of the Event (घटना का समय और दिनांक: 21-05-2026 22:49

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)	12198	12128
Andhra Pradesh State Generation (MW)	9150	9156
Grid Frequency (Hz)	49.91	49.98
SR Demand (MW)	56906	56879
SR Generation (MW)	57438	57405

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

Elements under outage	1. KODURU - 220KV
Weather Condition (मौसम स्थिति)	Normal

At 220kV Renigunta SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-RENIGUNTA-RACHAGUNNERI-1 2. 220KV-CUDDAPAH-RENIGUNTA-1	1. 220KV-RENIGUNTA-RACHAGUNNERI-2 2. 220KV-RENIGUNTA-NAGIRI-1 3. 220KV-CHITTOOR-RENIGUNTA-1 4. 220KV-RENIGUNTA-KODURU-1

220kV Renigunta Kodur line was idle charged from Renigunta end

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	250.0 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):

Equipment Type	Equipment make
CT	WS industries
CB	ALSTOM

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

1. 220KV-CHITTOOR-RENIGUNTA-1
2. 220KV-CUDDAPAH-RENIGUNTA-1
3. 220KV-RENIGUNTA-NAGIRI-1
4. 220KV-RENIGUNTA-RACHAGUNNERI-1
5. 220KV-RENIGUNTA-RACHAGUNNERI-2
6. 220KV-RENIGUNTA-KODURU-1

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

As per the reports submitted, the triggering incident was R-Phase CT failure in 220kV 220kV Nagari Renigunta line at Renigunta SS leading to a 220kV Bus fault. Further as the failure R-ph CT fire has come into vicinity and the CB connected to Nagiri also failed (as per FIR) as shown below. This has led to a R-G fault at 22:49:10.960 Hrs which cleared in time and later developed into R-Y-B fault at 22:49:11.600 Hrs.



[illegible]

220KV-RENIGUNTA-NAGIRI-1:

220KV-CUDDAPAH-RENIGUNTA-1:

220KV-CHITTOOR-RENIGUNTA-1:

220KV-RENIGUNTA-RACHAGUNNERI-1:

Page 5 of 248

in zone-2 and the line tripped after around 350ms. At Renigunta end, it is reported from the FIR that the line is holding.

220KV-RENIGUNTA-RACHAGUNNERI-2:

The R-G fault was initially sensed at Rachagunneri end in zone-2 start and the line was holding at both end without any pole tripping. At rachagunneri end, Later for the Y-G fault, the fault was initially sensed in zone-2 start and then it eventually became RY-G fault which was sensed in zone-1 and the line tripped. At Renigunta end, the fault was sensed in zone-4 and later carrier was received and the line tripped. It is suspected that Zone-1 protection operated at Rrenigunta end during RY-G fault as carrier send was seen in the DR. The line tripped at both ends.

Tripping of all these lines led to complete outage of 220kV Renigunta SS .

11. DR Analysis:

RENIGUNTA - 220KV

	RENIGUNTA - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:21-05-2026 22:49:10.929 Any Start, IN>1 Start DIST Rev, Z4, DIST Start A IN>1 Start Any Start, IN>1 Start DIST Rev, Z4, DIST Start B External Trip A External Trip B, External Trip C Any Trip, 86A Optd DIST Start A R Ph Open B Ph Open Y Ph Open Any Pole Dead, All Pole Dead Ir (max): 3.62 kA Iy (max): 3.29 kA Ib (max): 0.63 kA Vr (max): 141.02 kV Vy (max): 146.99 kV Vb (max): 151.58 kV DR Trigger Time:21-05-2026 22:49:10.926 Any Start, IN>1 Start DIST Rev, DIST Start A Z4

	Any Start, IN>1 Start Any Start, IN>1 Start DIST Start B DIST Rev Z4 External Trip A, External Trip B, External Trip C A/R Lockout, DIST Start A, 86A Optd Any Trip AR Lockout Shot> 86B Optd B Ph Open Any Pole Dead, R Ph Open, Y Ph Open All Pole Dead DIST. Chan Recv, CR-2 Ir (max): 9.53 kA Iy (max): 5.77 kA Ib (max): 0.70 kA Vr (max): 139.04 kV Vy (max): 143.99 kV Vb (max): 146.60 kV
--	---

220KV-RENIGUNTA-NAGIRI-1

	RENIGUNTA - 220KV	NAGIRI - 220KV
Time Sync Issue	No	Yes
DR Analysis	DR is not available	DR Trigger Time:21-05-2026 23:46:19.815 Any Start, IN>1 Start DIST Start A, Dist Start N DIST. Chan Recv, L8 CARR REC CH1 Z2 Any Trip, DIST Trip A, 3P Trip, R12 86A TR-Z2_.., R18 86B TR- Z2_.. L13 86A OP-LBBIN, L14 86B

		OP-LBBIN I>3 Start L1 M CB OPN-R Dist Start N L3 M CB OPN-B L2 M CB OPN-Y External Trip A, External Trip B, External Trip C Ir (max): 1.88 kA Iy (max): 0.16 kA Ib (max): 0.28 kA Vr (max): 129.82 kV Vy (max): 152.08 kV Vb (max): 141.74 kV
--	--	--

220KV-RENIGUNTA-RACHAGUNNERI-2

	RENIGUNTA - 220KV	RACHAGUNNERI - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:21-05-2026 22:49:10.926 Any Start, IN>1 Start DIST Rev, DIST Start A Z4 Any Start, IN>1 Start Any Start, IN>1 Start DIST Start B DIST Rev Z4 External Trip A, External Trip B, External Trip C A/R Lockout, DIST Start A, 86A Optd Any Trip AR Lockout Shot>	DR Trigger Time:21-05-2026 22:49:10.913 IEDStartup PhAStartup, ZeroSeqStartup PhBStartup, ZeroSeqStartup PilotDistRcvMsg, X9_BI9: CARR RECEIVE CH-1 PhAStartup TripSplitPhTripA, TripSplitPhTripB, TripSplitPhTripC, Trip3PhTrip, PilotDistSendMsg, PilotDistTrip X7_BO1: 86A RELAY CKT, X7_BO4: R-PH TRIP RLY CKT, X7_BO5: Y-PH TRIP RLY CKT, X7_BO6: B-PH TRIP RLY CKT,

	86B Optd B Ph Open Any Pole Dead, R Ph Open, Y Ph Open All Pole Dead DIST. Chan Recv, CR-2 Ir (max): 9.53 kA Iy (max): 5.77 kA Ib (max): 0.70 kA Vr (max): 139.04 kV Vy (max): 143.99 kV Vb (max): 146.60 kV	X7_BO7: 86B RELAY CKT X9_BI3: 3PH GRP A/B TRIP PhAOpenPosn, X7_BI1: CB R PH OPEN PhCOpenPosn, X7_BI3: CB B PH OPEN PhBOpenPosn, X7_BI2: CB Y PH OPEN X9_BI1: PREP 3.PH TRIP Ir (max): 9.28 kA Iy (max): 5.63 kA Ib (max): 0.68 kA Vr (max): 127.84 kV Vy (max): 128.30 kV Vb (max): 128.09 kV DR Trigger Time:21-05-2026 22:49:11.878 TOC1-START ZONE3_START ZONE2_START, ZONE[2]_STL1 TOC1-START ZONE3_START ZONE2_START, ZONE[2]_STL2 Carr Rec ch-1 ZONE[2]_STL1 ZONE1_TRIP, ZONE1_START, 1ph INITIATIO TRIP R, Carr Send, TRIP-Rphase, TRP1-TRIP 86GA/GB OPTD ZCOM TRIP CB R PH OPEN CB BPH OPEN CB YPH OPEN
--	--	--

		Ir (max): 9.23 kA Iy (max): 5.64 kA Ib (max): 0.68 kA Vr (max): 127.52 kV Vy (max): 128.16 kV Vb (max): 128.08 kV
--	--	--

220KV-RENIGUNTA-RACHAGUNNERI-1

	RENIGUNTA - 220KV	RACHAGUNNERI - 220KV
Time Sync Issue	No	No
DR Analysis	Line was holding	DR Trigger Time:21-05-2026 22:49:10.914 IEDStartup PhAStartup, ZeroSeqStartup PilotDistRcvMsg, X9_BI9: CARR RECEIVE CH-1 TripSplitPhTripA, PilotDistTrip PilotDistSendMsg X7_BO4: R-PH TRIP RLY CKT PhAOpenPosn, X7_BI1: CB R PH OPEN PhBStartup ZeroSeqStartup X9_BI1: PREP 3.PH TRIP PhBStartup, ZeroSeqStartup TripSplitPhTripA, TripSplitPhTripB, TripSplitPhTripC, Trip3PhTrip, IEDTrip3Ph/BlkAR, DistZ2Trip X7_BO1: 86A RELAY CKT, X7_BO4: R-PH TRIP RLY CKT, X7_BO5: Y-PH TRIP RLY CKT, X7_BO6: B-PH TRIP RLY CKT, X7_BO7: 86B RELAY CKT

		X9_BI3: 3PH GRP A/B TRIP PhBOpenPosn, PhCOpenPosn, X7_BI2: CB Y PH OPEN, X7_BI3: CB B PH OPEN PhBStartup, ZeroSeqStartup Ir (max): 4.69 kA Iy (max): 6.65 kA Ib (max): 1.36 kA Vr (max): 127.78 kV Vy (max): 128.50 kV Vb (max): 128.21 kV DR Trigger Time:21-05-2026 22:49:10.933 ZONE3_START ZONE2_START CB R PH OPEN ZONE3_START ZONE2_START ZONE2_TRIP TRIP Y CB YPH OPEN CB BPH OPEN Ir (max): 4.69 kA Iy (max): 6.66 kA Ib (max): 1.36 kA Vr (max): 127.60 kV Vy (max): 128.28 kV Vb (max): 128.18 kV DR Trigger Time:21-05-2026 22:49:10.998 ZONE3_START ZONE2_START CB R PH OPEN ZONE3_START ZONE2_START ZONE2_TRIP TRIP Y CB YPH OPEN
--	--	---

		CB BPH OPEN Ir (max): 4.69 kA Iy (max): 6.66 kA Ib (max): 1.36 kA Vr (max): 127.60 kV Vy (max): 128.28 kV Vb (max): 128.18 kV
--	--	---

220KV-CUDDAPAH-RENIGUNTA-1

	CUDDAPAH - 220KV	RENIGUNTA - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:21-05-2026 22:49:10.935 Any Start Z2 Any Trip, DIST Trip A, R14 Zcom Trip, L4 CARR REC CH2, L8 CARR REC CH1, R4 1PH TR-R Any Start Z2 A/R Lockout L13 86A OP-LBBIN L14 86B OP-LBBIN Ir (max): 1.71 kA Iy (max): 1.64 kA Ib (max): 0.64 kA Vr (max): 133.82 kV Vy (max): 134.42 kV Vb (max): 132.78 kV DR Trigger Time:21-05-2026 22:49:10.967 TEF1-STFW, TEF1- 2NDHARMD PHS-STFWL1, PHS-STFWPE, PHS START	DR Trigger Time:21-05-2026 22:49:10.927 Any Start, IN>1 Start DIST Rev, DIST Start A Z4 Any Start, IN>1 Start DIST Rev, Z4, DIST Start B Any Pole Dead All Pole Dead All Pole Dead Ir (max): 1.74 kA Iy (max): 1.67 kA Ib (max): 0.65 kA Vr (max): 139.65 kV Vy (max): 144.69 kV Vb (max): 147.16 kV

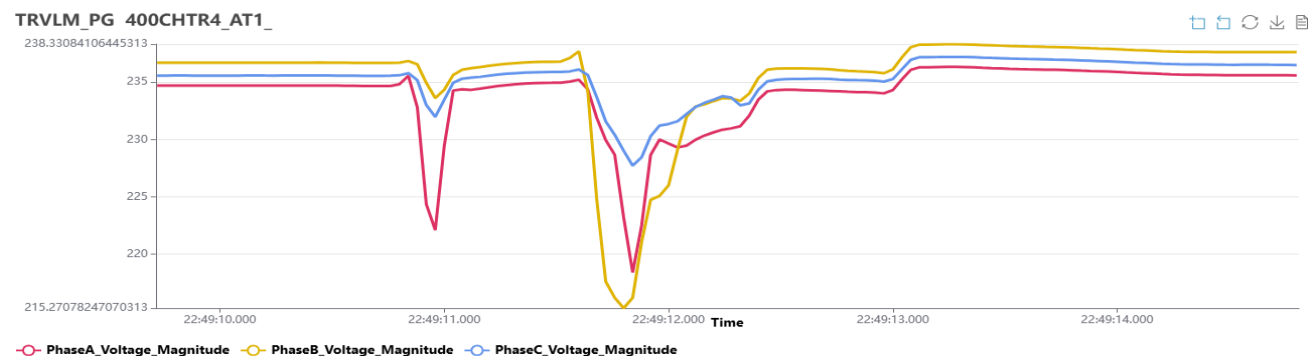
	ZM03-START, ZM04-START ZM02-START TEF1-START BI EXT TRIPL1 TEF1-2NDHARMD AR INPROGR CB_RPH_OPEN TEF1-2NDHARMD TEF1-STRV BRC START AR PREP3P TEF1-2NDHARMD PHS-STFWL2, PHS-STFWPE, PHS START ZM03-START, ZM04-START ZM02-START BI EXT TRIP3P CB_BPH_OPEN CB_YPH_OPEN TEF1-STFW, TEF1- 2NDHARMD L1 FUSE FAIL Ir (max): 1.68 kA Iy (max): 1.61 kA Ib (max): 0.63 kA Vr (max): 137.63 kV Vy (max): 132.09 kV Vb (max): 143.56 kV	
--	---	--

220KV-CHITTOOR-RENIGUNTA-1

	RENIGUNTA - 220KV	CHITTOOR - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:21-05-2026 22:49:10.929	DR Trigger Time:21-05-2026 22:49:10.935

	Any Start, IN>1 Start DIST Rev, Z4, DIST Start A IN>1 Start Any Start, IN>1 Start DIST Rev, Z4, DIST Start B External Trip A External Trip B, External Trip C Any Trip, 86A Optd DIST Start A R Ph Open B Ph Open Y Ph Open Any Pole Dead, All Pole Dead Ir (max): 3.62 kA Iy (max): 3.29 kA Ib (max): 0.63 kA Vr (max): 141.02 kV Vy (max): 146.99 kV Vb (max): 151.58 kV	IN>1 Start Z2 I>1 Start IN>1 Start Z2 I>1 Start Ir (max): 3.62 kA Iy (max): 3.28 kA Ib (max): 0.60 kA Vr (max): 137.00 kV Vy (max): 137.99 kV Vb (max): 137.09 kV DR Trigger Time:21-05-2026 22:49:10.935 IN>1 Start Z2 I>1 Start IN>1 Start Z2 I>1 Start Ir (max): 3.62 kA Iy (max): 3.28 kA Ib (max): 0.60 kA Vr (max): 137.00 kV Vy (max): 137.99 kV Vb (max): 137.09 kV
--	--	--

12. A) PMU Analysis:



From PMU dip in R-G fault is observed followed by Y-G fault which eventually became RY-G fault which was cleared with a delay of around 350ms.

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

Constituent	Points for review
APTRANSCO	1. Non operation of 220kV BBP at Renigunta end. 2. Zone-1 over reach in 220kV Renigunta Rachagunneri Line-2 at Rachagunneri end. 3. Reason for sending DT to Cuddapah end from Renigunta end during Y-G fault. 4. Zone-4 delay time of 220kV Chittoor Renigunta Line-1 at Renigunta end needs to be reviewed.

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

Constituent	Remedial Actions
APTRANSCO	Faulty 220KV Nagari feeder got isolated and fire had quenched and the SubStation taken into service and Due to failure of Bus Bar relay (Out of Service) the split bus arrangement had made as follows 220KV Bus-1 220KV RCGR-1&2, 100MVA PTR-3 and 160MVA PTR-2 and on 220KV Bus-2 : 220KV CKP, 220KV KDR, 220KV MMG and 160MVA PTR-1

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

16. Restoration Details:

Restoration activities were taken up as detailed below:

1. 220 kV RGT–CK Palli feeder was charged from CK Palli end at 23:16 hrs.
2. 220 kV Rachagunneri feeder–1 was charged from Rachagunneri end at 23:27 hrs.
3. Supply was extended to both 220 kV Bus-1 and Bus-2, and supply to all 132 kV feeders was restored.
4. 220 kV Rachagunneri–2 feeder was charged at 23:47 hrs.
5. 220 kV Mahadevamangalam feeder was charged at 00:25 hrs.

6.220 kV Koduru feeder was charged at 00:45 hrs.

7. Bus coupler H/T and busbar protection were kept out of service, and split bus arrangement was made as follows:

220 kV Bus-1:

Bus 1 Connected Elements: 220KV Rachagunneri-1, 220KV C.K.Palli, 160MVA PTR-2 and 100MVA PTR-1

220KV Bus-2:

Bus 2 Connected elements: 220KV CKPalli, 220KV Koduru and 220KV M.Mangalam and 160MVA PTR-1

Normalcy was restored.

Duration of interruption was from 22:49 hrs to 23:16 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	APTRANSCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	APTRANSCO
4	Any other non-compliance	IEGC section 17.3	APTRANSCO

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

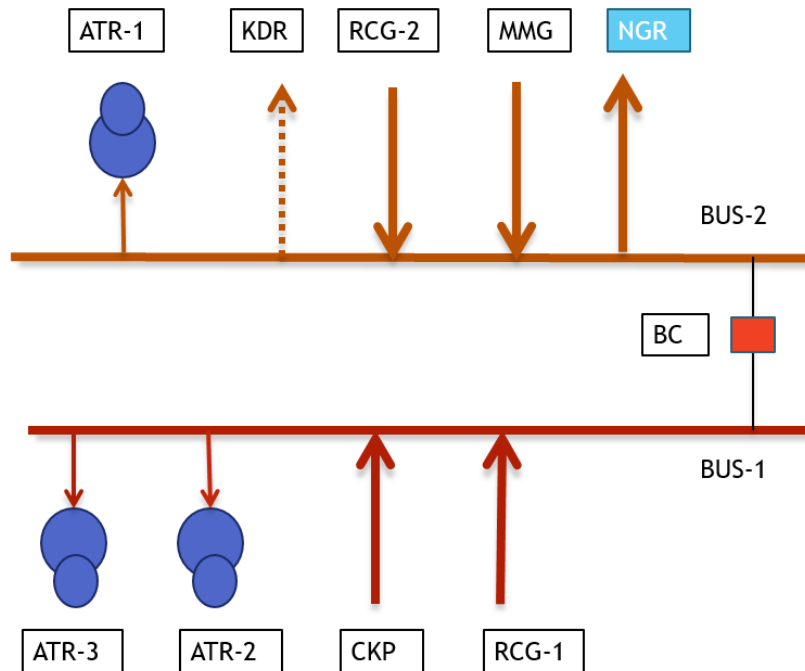
Annexure 1

Sequence of Events as per SCADA

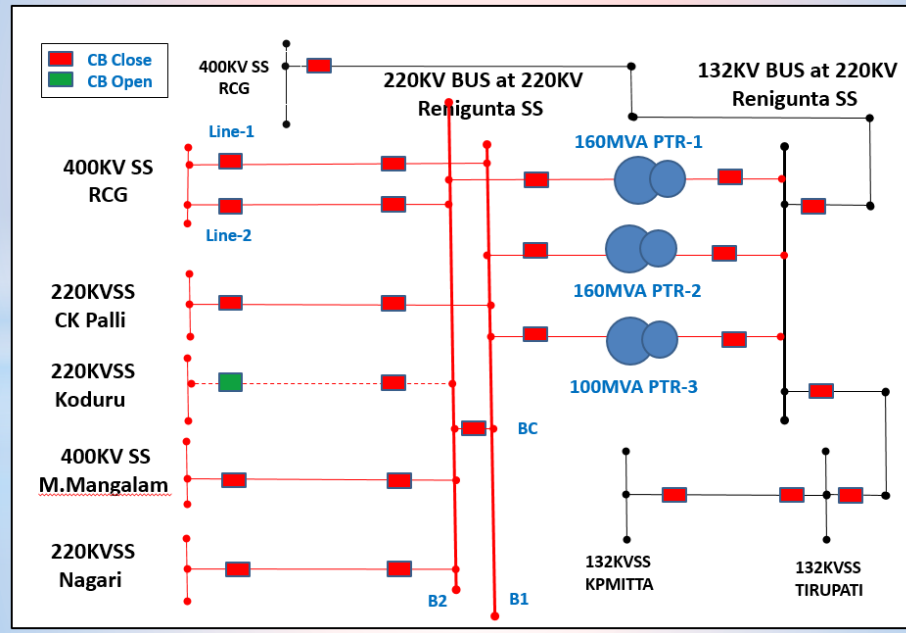
time	Event	Location
21-05-2026 22:49:19	RENIGUNTA CB 20452 (LINE-1 TO RCGN4) OPEN	RNGT2_AT
21-05-2026 22:49:19	RENIGUNTA CB 20252 (LINE TO CHTR4) BETWEEN	RNGT2_AT
21-05-2026 22:49:27	RENIGUNTA CB 11052 (LOAD-1 PTTR) BETWEEN	RNGT2_AT

Deliberations:

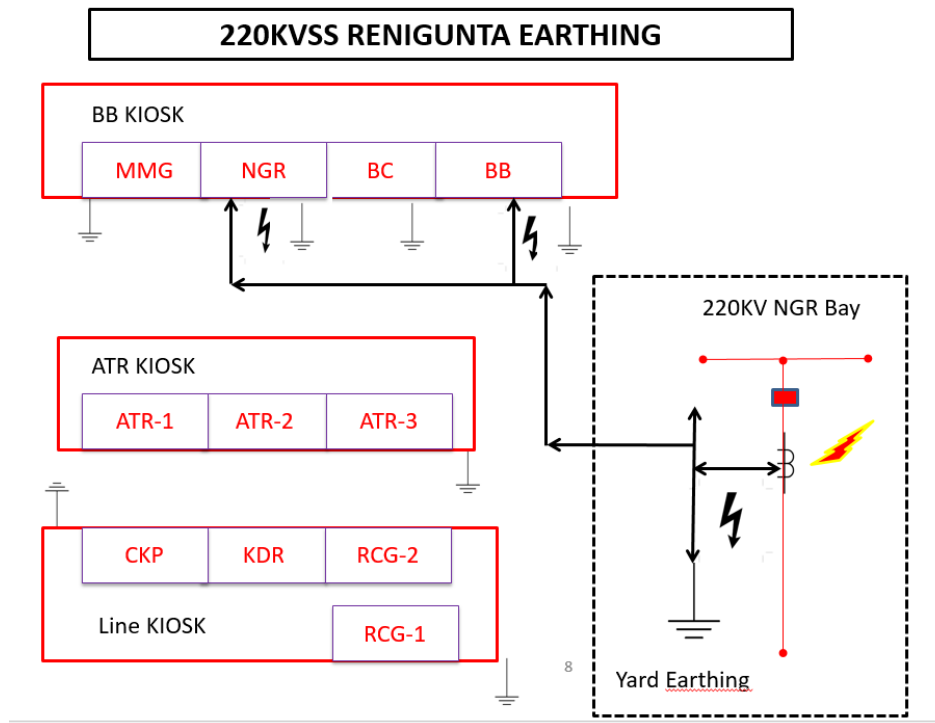
1. APTRANSCO stated that, under antecedent conditions, 220 kV Bus-1 was connected to CK Palli Line, Rachagunneri-1 Line, ATR-2, and ATR-3, while 220 kV Bus-2 was connected to Koduru Line, Rachagunneri-2 Line, M. Mangalam Line, Nagari Line, and ATR-1. The 220 kV Bus Coupler was in the closed position, interconnecting both bus sections. Further, the 220 kV Renigunta–Koduru transmission line was operating in an open-ring configuration, with the ring opened at 220 kV Koduru Substation.



Pre-fault Source Connectivity diagram of 220KVSS Renigunta

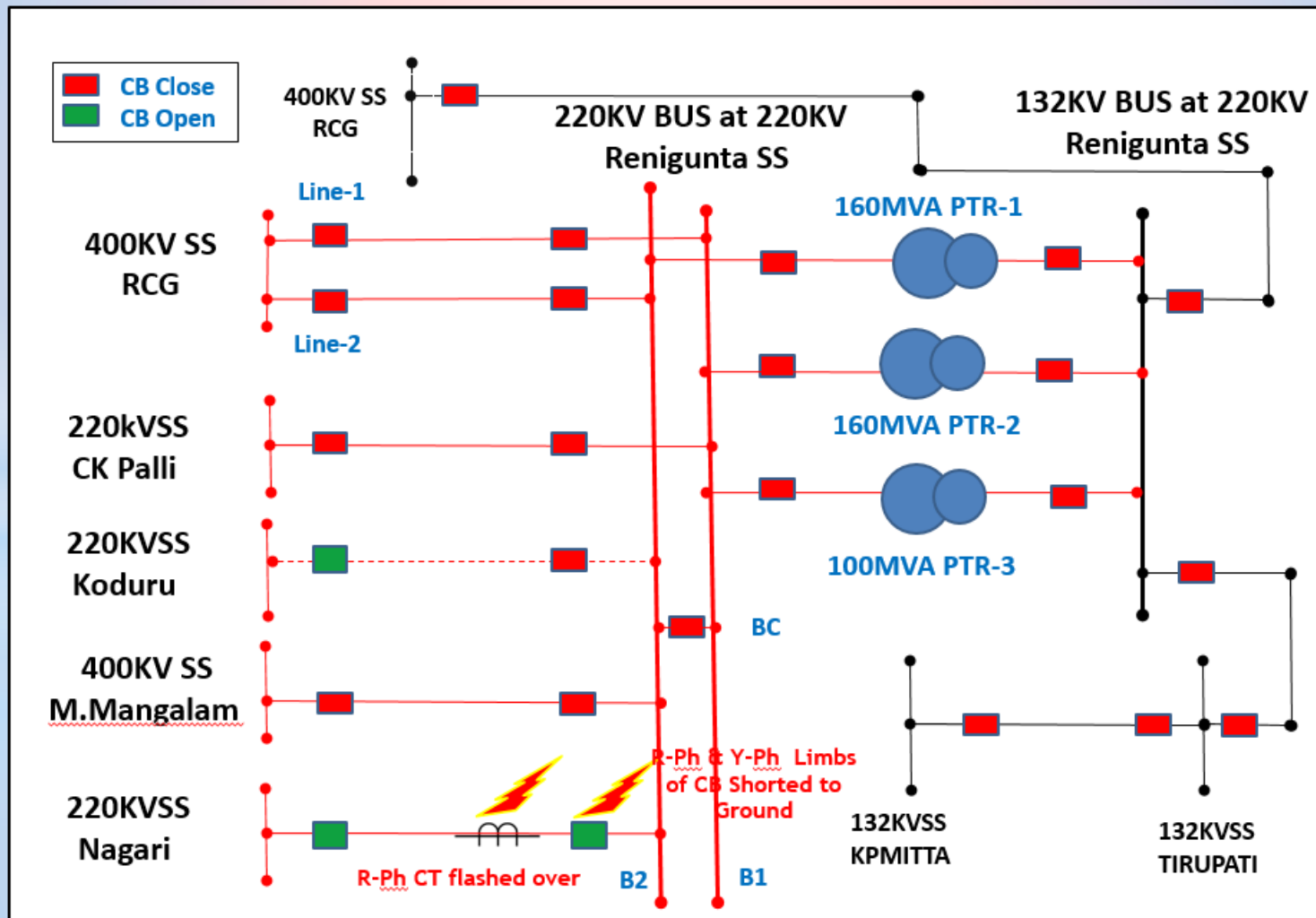


2. APTRANSCO stated that on 22.05.2026 at 22:49 hrs, at 220/132/33 kV Renigunta Substation, the R-phase Current Transformer (Make: WS Industries, Year of Manufacture: 2000) of the 220 kV Nagari feeder exploded. Consequently, the 220 kV Nagari feeder tripped at both ends within 100 ms.
3. APTRANSCO informed that the fault current discharged through the Control and Relay (C&R) panel, resulting in extensive damage to the 220 kV Nagari feeder C&R panel, including the relays and associated wiring. The incident also caused failure of the Busbar Protection (BBP) relay and the Bus Coupler Bay Control Unit (BCU), as these panels were installed adjacent to the Nagari feeder C&R panel within the same kiosk.
4. APTRANSCO further stated that although the 220 kV Nagari feeder circuit breaker had tripped, the fire caused by the CT explosion spread to the R-phase and Y-phase breaker limbs and the circuit breaker cubicle, resulting in flashover of the R and Y phase breaker limbs to ground, which subsequently developed into a bus fault.
5. APTRANSCO stated that the power cards of the Busbar Protection relays and the Bus Coupler relay were also damaged due to the high voltages induced from the adjacent failed 220 kV Nagari feeder C&R panel, leading to the failure of the Busbar Protection scheme. As the Busbar Protection was unavailable, the bus fault was ultimately cleared by tripping all connected source elements from the remote ends.
6. SRPC enquired about the reason for the fault current reaching the Busbar Protection relay. APTRANSCO stated that, due to an earthing issue, the fault current propagated to the **Busbar Protection panel**, resulting in damage to the panel

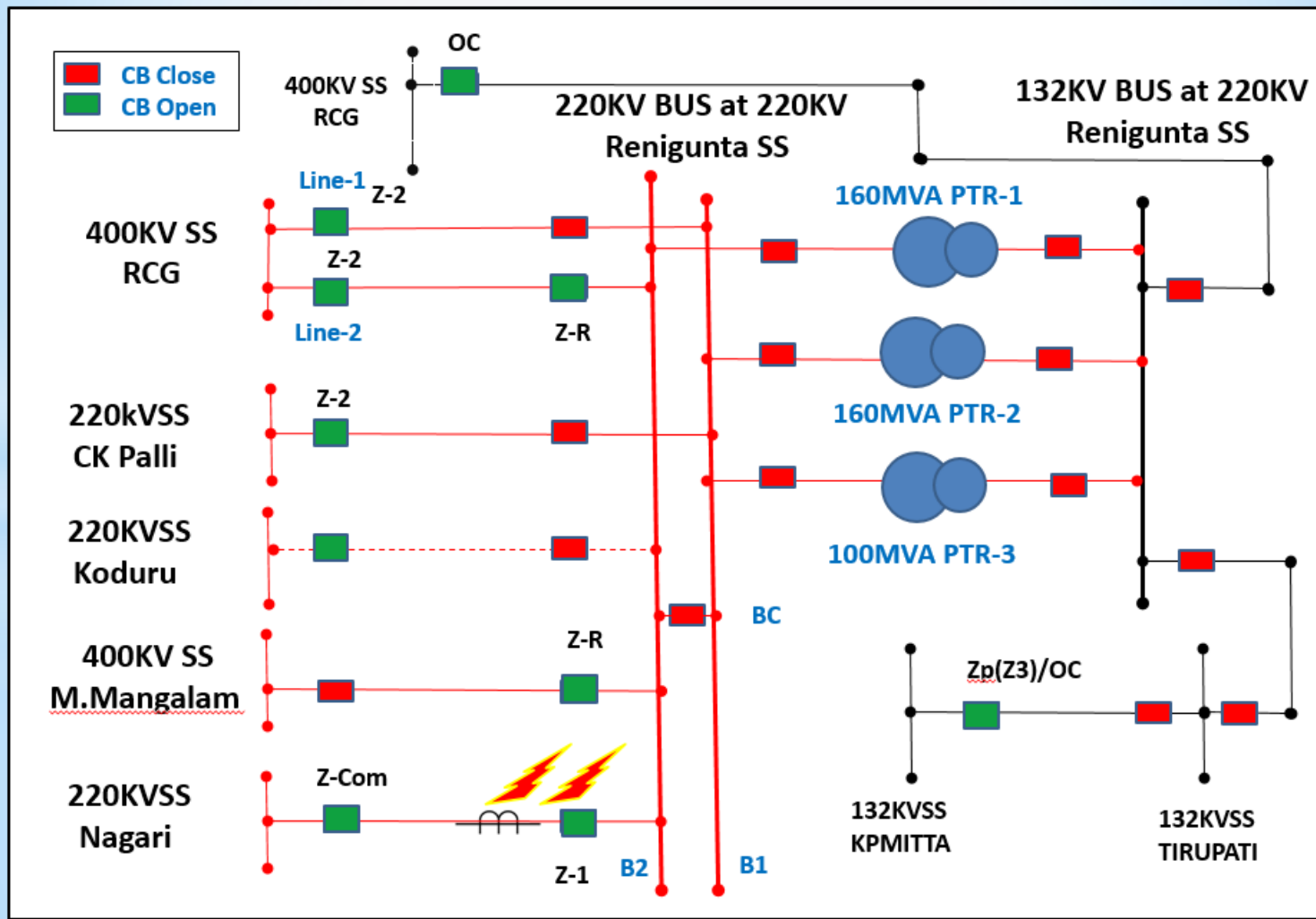


7. APTRANSCO further clarified that the R-phase CT flashover initiated the event, following which the R-phase breaker opened. Subsequently, the fire spread to the adjacent equipment, leading to Y-phase and B-phase faults

Connectivity diagram of 220KVSS Renigunta at the time of fault:



Connectivity diagram of 220KVSS Renigunta at the time of fault:



8. APTRANSCO informed that, for the Nagari Bay CT flashover at Renigunta Substation, the fault was detected in Zone-2 at the Nagari end, and upon receipt of the carrier signal from Renigunta Substation, the line tripped through the Zone Communication (Z-Com) scheme.
9. APTRANSCO stated that the 220 kV Koduru feeder tripped at the Koduru end on receipt of a Direct Transfer Trip (DTT) signal, while no tripping occurred at the Renigunta end. APTRANSCO explained that the DTT was initiated due to a momentary DC grounding issue.
10. APTRANSCO further stated that the 220 kV M. Mangalam feeder tripped at Renigunta Substation on Zone-1 protection. SRPC observed that this was

an incorrect operation, as the feeder should have tripped on Reverse Zone protection. APTRANSCO explained that, due to a VT fuse failure during the disturbance, the relay incorrectly operated in Zone-1.

11. It was further informed that the 132 kV KP Mitta feeder tripped at the KP Mitta end on Zone-3 protection. SRPC highlighted the relay coordination issues between KP Mitta and Tirupati Substation and requested APTRANSCO to review the protection settings and furnish the revised relay settings implemented to the forum.

Picture of failed CT



Failed Equipment (220KV Nagari line C&R Panel)



12. Remedial Actions Taken:

- Bus Coupler restored after power card replacement with spare card on 23-05-2026
- Failed 220KV Nagari bay CTs , Circuit Breaker and C&R Panels replaced with New Equipment and feeder charged on 09-06-2026
- Failed NR make Bus Bar Panel is to be replaced with New HITACHI make Bus Bar Panel

Recommendations:

- ✚ **APTRANSCO to review the Earthing of all equipment and control panels at Renigunta SS and submit a report to SRPC & SRLDC on healthiness of Earthing.**
- ✚ **APTRANSCO to rectify the AC& DC mixing issues**
- ✚ **APTRANSCO to bring BUS BAR Protection back into service at the earliest.**
- ✚ **APTRANSCO to review Distance and Over current relay coordination to be done for all the lines at 220kV Renigunta SS, 132 KPMITTA SS, 132KV Tirupati SS**
- ✚ **APTRANSCO to rectify the DR time sync issue at Nagari 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	Complete Outage of 400kV ILFS of ITPCL	400kV ILFS is only connected to NAGAPATTNAM_PS through 400KV-ILFS-NAGAPATTNAM_PS-1&2 lines. In the antecedent conditions, 400KV-ILFS-NAGAPATTNAM_PS-2 was under outage due to planned shutdown and hence 400kV ILFS was radially connected to NAGAPATTNAM_PS prior to the event through 400KV-ILFS-NAGAPATTNAM_PS-1. The triggering incident was R-G fault in 400KV-ILFS-NAGAPATTNAM_PS-1. Tripping of the only connected line led to complete outage of 400KV-ILFS and a generation loss of around 557MW.	22-05-2026 12:45	557	0	GD - 1	04-06-2026	-	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

400kV ILFS is only connected to NAGAPATTNAM_PS through 400KV-ILFS-NAGAPATTNAM_PS-1&2 lines. In the antecedent conditions, 400KV-ILFS-NAGAPATTNAM_PS-2 was under outage due to planned shutdown and hence 400kV ILFS was radially connected to NAGAPATTNAM_PS prior to the event through 400KV-ILFS-NAGAPATTNAM_PS-1. The triggering incident was R-G fault in 400KV-ILFS-NAGAPATTNAM_PS-1. Tripping of the only connected line led to complete outage of 400KV-ILFS and a generation loss of around 557MW.

2. Time and Date of the Event (घटना का समय और दिनांक): 22-05-2026 12:45

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)	16546	16462
TamilNadu State Generation (MW)	15351	15350
Grid Frequency (Hz)	50.04	50.04
SR Demand (MW)	59567	59503
SR Generation (MW)	62240	61832

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

Elements under outage	1. 400KV-ILFS-NAGAPATTNAM_PS-2
Weather Condition (मौसम स्थिति)	Windy

ILFS End :-

Unit-2 in service condition at 557MW generation & unit-1 under Shutdown condition

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

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

7. Duration of interruption (रुकावट की अवधि): 0 hours, 35 minutes

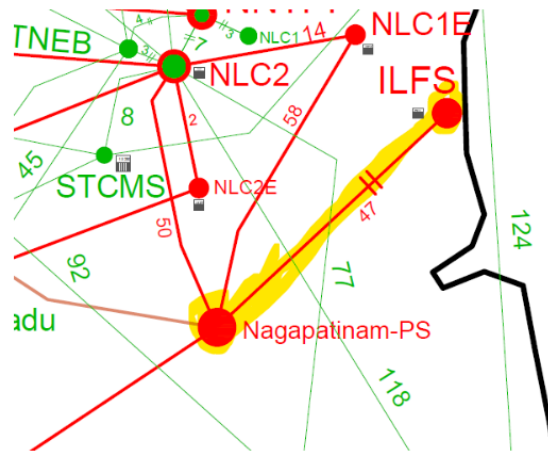
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 400KV-ILFS-NAGAPATTNAM_PS-1
2. 420KV/22KV ILFS-GT-2

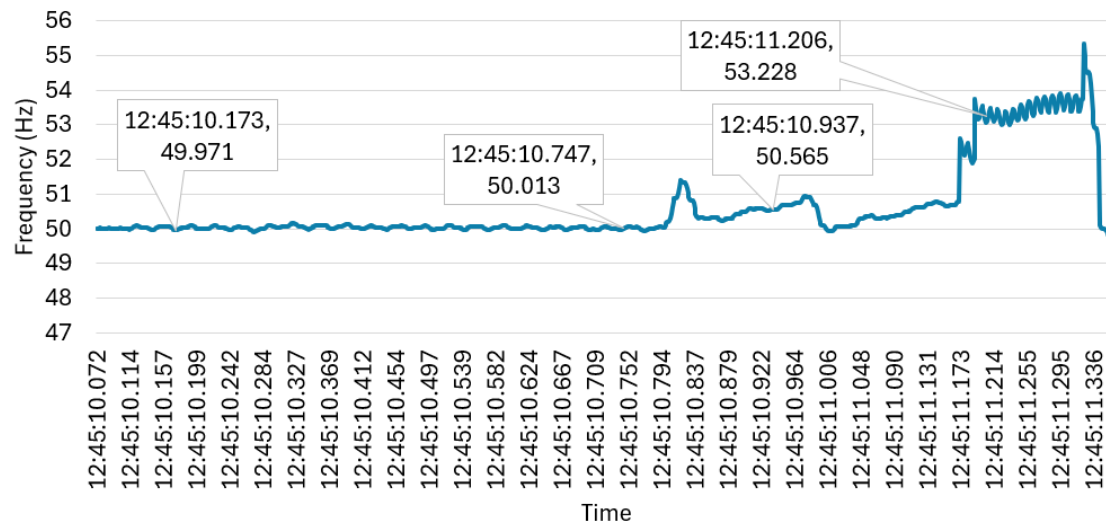
10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

400kV ILFS is only connected to NAGAPATTNAM_PS through 400KV-ILFS-NAGAPATTNAM_PS-1&2 lines. In the antecedent conditions, 400KV-ILFS-NAGAPATTNAM_PS-2 was under outage due to planned shutdown and hence 400kV ILFS was radially connected to NAGAPATTNAM_PS prior to the event through 400KV-ILFS-NAGAPATTNAM_PS-1.



The triggering incident was R-G fault in 400KV-ILFS-NAGAPATTNAM_PS-1. At NAGAPATTNAM_PS end, the fault was sensed in Z1 and R-pole opened, carrier was sent to remote end (as per DR), AR operated after around 1s and was successful and the line was holding. At ILFS, the fault was sensed in Z2, however the carrier was not received from remote end and continued to feed the fault and 3ph tripped on Z2 time trip. Tripping of the only connected line during the event (400KV-ILFS-NAGAPATTNAM_PS-1) at ILFS end led to complete outage of 400KV-ILFS of ITPCL. During the event, ILFS U2 was generating around 557MW and tripped due to Low forward power due to the loss of evacuation lines and led to a generation loss of around 557MW. The frequency plot observed as per the DR available at ILFS U2 is as below.

Frequency at ILFS U2 (DR data)



11. DR Analysis:

ILFS - 400KV

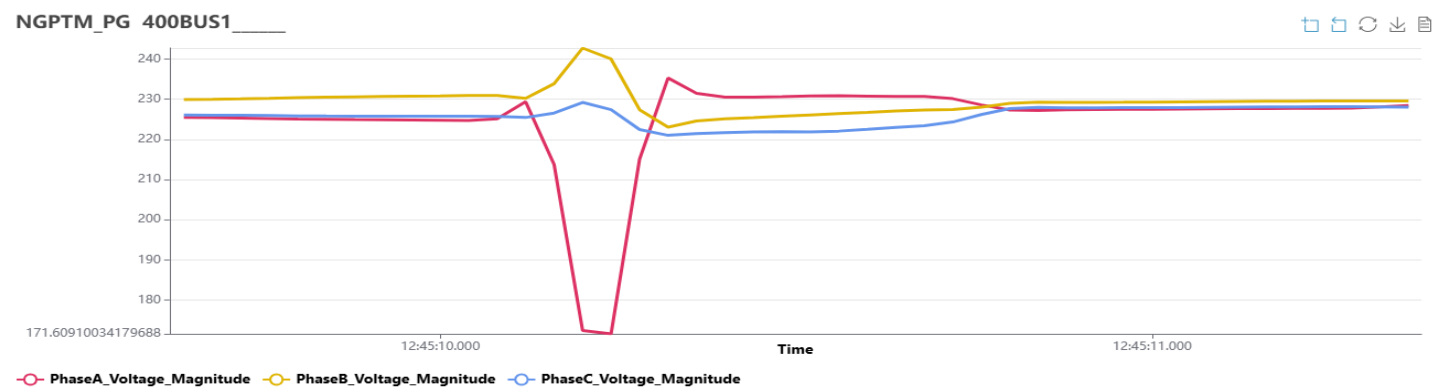
	ILFS - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:22-05-2026 12:45:10.271 Relay PICKUP Diff picked up Pf< TRIP, Relay TRIP Ir (max): 31.57 kA Iy (max): 18.28 kA Ib (max): 40.04 kA Vr (max): 14.58 kV Vy (max): 14.63 kV Vb (max): 14.61 kV DR Trigger Time:22-05-2026 12:45:10.186 Relay PICKUP Diff picked up Pf< TRIP, Relay TRIP f4 TRIP Ir (max): 31.50 kA Iy (max): 18.16 kA Ib (max): 40.21 kA Vr (max): 14.61 kV Vy (max): 14.67 kV Vb (max): 14.65 kV

400KV-ILFS-NAGAPATTNAM_PS-1

	ILFS - 400KV	NAGAPATTNAM_PS - 400KV
Time Sync Issue	No	Yes
DR Analysis	DR Trigger Time:22-05-2026 12:45:10.222 EF Pickup, Relay PICKUP, Relay PICKUP E Dis.Pickup L1, Dis.Pickup E, Dis. forward, Relay PICKUP L1 Relay TRIP L1, Relay TRIP L2, Relay TRIP L3, Relay TRIP	DR Trigger Time:22-05-2026 12:45:09.427 M2 Z2 STR, M2Z3_ST M2_TRIP, M2 Z1 OPTD, M12CRSD M1_TRIP M CB_RO T CB_RO

	Ir (max): 3.41 kA Iy (max): 1.73 kA Ib (max): 0.79 kA Vr (max): 227.78 kV Vy (max): 229.94 kV Vb (max): 229.84 kV DR Trigger Time:22-05-2026 12:45:10.222 EF Pickup, Relay PICKUP, Relay PICKUP E Dis.Pickup L1, Dis.Pickup E, Dis. forward, Relay PICKUP L1 Relay TRIP L1, Relay TRIP L2, Relay TRIP L3, Relay TRIP Ir (max): 3.41 kA Iy (max): 1.73 kA Ib (max): 0.79 kA Vr (max): 227.78 kV Vy (max): 229.94 kV Vb (max): 229.84 kV	Ir (max): 10.41 kA Iy (max): 1.70 kA Ib (max): 0.78 kA Vr (max): 238.26 kV Vy (max): 261.91 kV Vb (max): 240.31 kV DR Trigger Time:22-05-2026 12:45:09.423 M1_TRIP, M1Z1_OP, M1Z2_ST, M1Z3_ST, M12CRSD M2_TRIP M_CB_RO T_CB_RO M_CB_AR T_CB_AR Ir (max): 10.57 kA Iy (max): 1.73 kA Ib (max): 0.79 kA Vr (max): 238.07 kV Vy (max): 262.98 kV Vb (max): 244.39 kV DR Trigger Time:22-05-2026 12:45:09.427 M2 Z2 STR, M2Z3_ST M2_TRIP, M2 Z1 OPTD, M12CRSD M1_TRIP M CB_RO T CB_RO Ir (max): 10.41 kA Iy (max): 1.70 kA Ib (max): 0.78 kA Vr (max): 238.26 kV Vy (max): 261.91 kV Vb (max): 240.31 kV
--	--	---

12. A) PMU Analysis:



From the PMU plot, dip in R-phase voltage is observed indicating R-G fault during the event.

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

Constituent	Points for review
ILFS	1. Non receipt of carrier and tripping of the line in Z2 time trip needs review 2. Non furnishing of detailed report needs review

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

Constituent	Remedial Actions
ILFS	1. Tree removal below the transmission line corridor taken up.

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

16. Restoration Details:

22-05-2026 12:49

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

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

Annexure 1

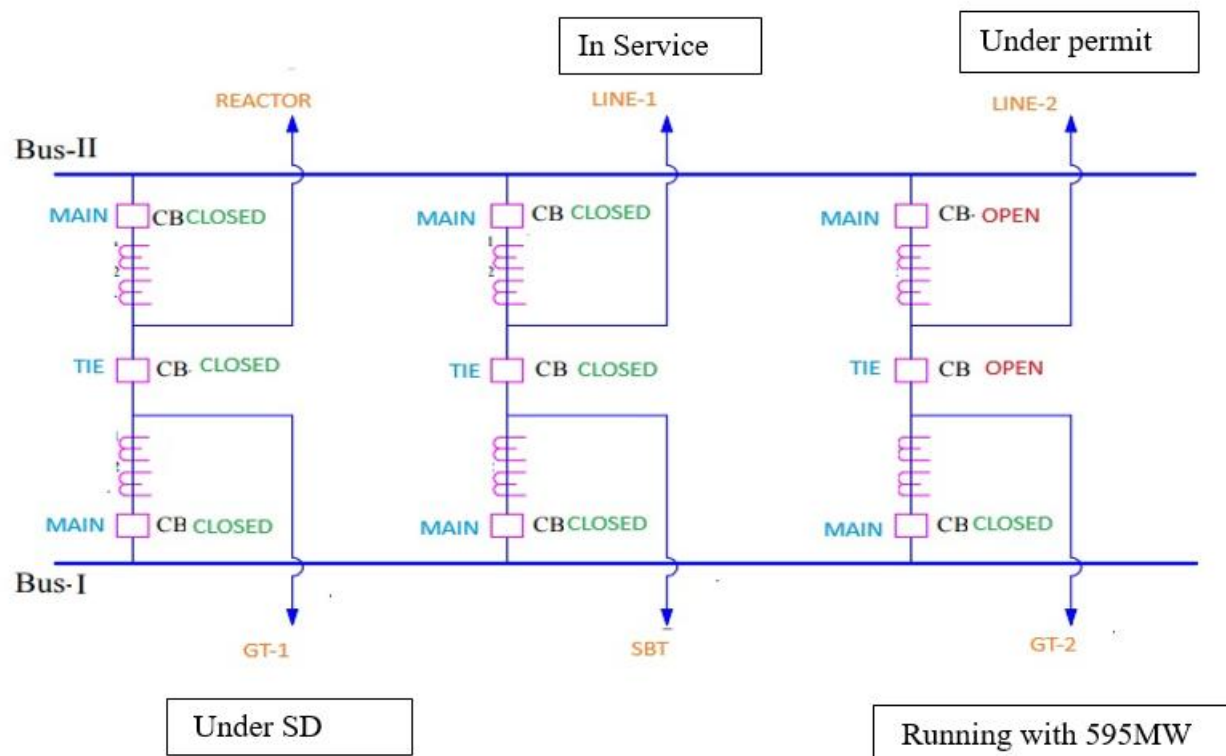
Sequence of Events as per SCADA

time	Event	Location
22-05-2026 12:45:12	IL&FS GS LINE 400kV LINE 1 to NGPTM TRIP	ILFS4_CS
22-05-2026 12:45:12	IL&FS GS CB TIE 05 - CB 40552 OPEN	ILFS4_CS
22-05-2026 12:45:12	IL&FS GS CB TIE 04 - CB 40452 OPEN	ILFS4_CS
22-05-2026 12:45:14	IL&FS GS XFMR_P UNIT 2 XF PRIMARY FAILED	ILFS4_CS
22-05-2026 12:45:14	IL&FS GS CB TIE 09 - CB 40952 TRIP	ILFS4_CS
22-05-2026 12:45:14	IL&FS GS CB TIE 09 - CB 40952 OPEN	ILFS4_CS
22-05-2026 12:45:14	IL&FS GS UNIT UNIT G2 AUTO	ILFS4_CS
22-05-2026 12:49:52	IL&FS GS CB TIE 04 - CB 40452 CLOSED	ILFS4_CS
22-05-2026 12:50:05	IL&FS GS CB TIE 05 - CB 40552 CLOSED	ILFS4_CS

Deliberations:

1. ITPCL stated that, under antecedent conditions, the **400 kV GIS Substation** was configured in a **one-and-a-half breaker scheme** comprising **Unit-1 and Unit-2 Generator Bays, Line-1 and Line-2 Bays, one Reactor Bay, and one Standby Transformer Bay**. It was further informed that the **400 kV ITPCL–Nagapattinam Line-2** was under outage at the time of the incident.

Antecedent Condition SLD:



2. ITPCL stated that the triggering incident occurred on 22.05.2026 at 12:45 hrs. Analysis of the Disturbance Recorder (DR) indicated that a single-phase to ground fault had initiated on 400 kV Nagapattinam Line-1. It was further informed that the fault subsequently evolved into a high-resistance sustained vegetation fault. The local relay detected the fault in Zone-2, resulting in three-pole tripping of the line.
3. SRPC enquired about the non-operation of Auto Reclosure (A/R) during the event. ITPCL stated that, since the fault had been detected in Zone-2, Auto Reclosure was intentionally blocked and therefore did not operate. SRPC, however, highlighted that the Disturbance Recorder at the Nagapattinam end indicated that the fault had been detected in Zone-1, with the carrier signal being transmitted, and enquired about the reason for the non-operation of the

carrier-aided protection scheme.

4. ITPCL stated that the issue was under detailed investigation and had been referred to the Original Equipment Manufacturer (OEM) for analysis. It was further informed that no carrier failure alarm had been observed during the event.
5. SRPC enquired regarding the primary teleprotection communication path and whether OPGW was being utilized. ITPCL stated that both teleprotection channels are presently established through PLCC, and that OPGW is not being used as the teleprotection communication medium for the line.

Recommendations:

✚ ***ITPCL to review the carrier transmit / receive logic at their Substation***

✚ ***PGCIL SR-II to rectify the DR time sync issue at Nagapatinnam SS***

✚ ***ITPCL to ensure that primary path for teleprotection is through OPGW as per CEA technical standards for construction of electrical plants and lines.***

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	Complete Outage of 220kV Garividi SS, 220kV Bobbili SS, 220kV Tekkali SS of APTRANSCO	During antecedent conditions, 220kV Maradam Bobbili line-2 was under shutdown and 220kV Garividi Bobbili Line-1 was in hand tripped condition at Garividi end. 220kV Bobbili SS, 220kV Garividi SS and 220kV Tekkali SS are being radially fed from 220kV Maradam Bobbili Line-1 and 220kV Maradam Garividi Line-1&2. As per the reports submitted, 220kV Maradam Bobbili Line-1 tripped on B-G fault at 11:48hrs, 220kV Maradam Garividi Line-2 tripped on B-G fault at 11:56hrs and 220kV Maradam Garividi Line-1 tripped at 11:57hrs on B-G fault. Tripping of all these lines led to complete outage of 220kV Garividi SS, 220kV Bobbili SS, 220kV Tekkali SS	23-05-2026 11:57	0	615	GD - 1	05-06-2026	29-05-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During antecedent conditions, 220kV Maradam Bobbili line-2 was under shutdown and 220kV Garividi Bobbili Line-1 was in hand tripped condition at Garividi end. 220kV Bobbili SS, 220kV Garividi SS and 220kV Tekkali SS are being radially fed from 220kV Maradam Bobbili Line-1 and 220kV Maradam Garividi Line-1&2. As per the reports submitted, 220kV Maradam Bobbili Line-1 tripped on B-G fault at 11:48hrs, 220kV Maradam Garividi Line-2 tripped on B-G fault at 11:56hrs and 220kV Maradam Garividi Line-1 tripped at 11:57hrs on B-G fault. Tripping of all these lines led to complete outage of 220kV Garividi SS, 220kV Bobbili SS, 220kV Tekkali SS

2. Time and Date of the Event (घटना का समय और दिनांक): 23-05-2026 11:57

3. Event Category (ग्रीड 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)	11252	11280
Andhra Pradesh State Generation (MW)	8619	8611
Grid Frequency (Hz)	49.95	49.95
SR Demand (MW)	58332	58348
SR Generation (MW)	59042	58916

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

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

At Garividi SS:

Bus Configuration Type : Single Bus

Bus Coupler Status : NA

Bus 1 Connected Elements
1. 220KV-GARIVIDI-BOBBILI-1 2. 220KV-GARIVIDI-BOBBILI-2 3. 220KV-GARIVIDI-MARADAM-1 4. 220KV-GARIVIDI-MARADAM-2 5. 220KV-GARIVIDI-TEKKALI-1 6. 220KV-GARIVIDI-TEKKALI-2

At 220kV Bobbili SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-BOBBILI-MARADAM-2 2. 220KV-GARIVIDI-BOBBILI-1 3.	1. 220KV-BOBBILI-MARADAM-1 2. 220KV-GARIVIDI-BOBBILI-2

At 220kV Tekkali SS:

Bus Configuration Type : Single Bus

Bus Coupler Status : NA

Bus 1 Connected Elements
1. 220KV-GARIVIDI-TEKKALI-1 2. 220KV-GARIVIDI-TEKKALI-2

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	615.0 MW

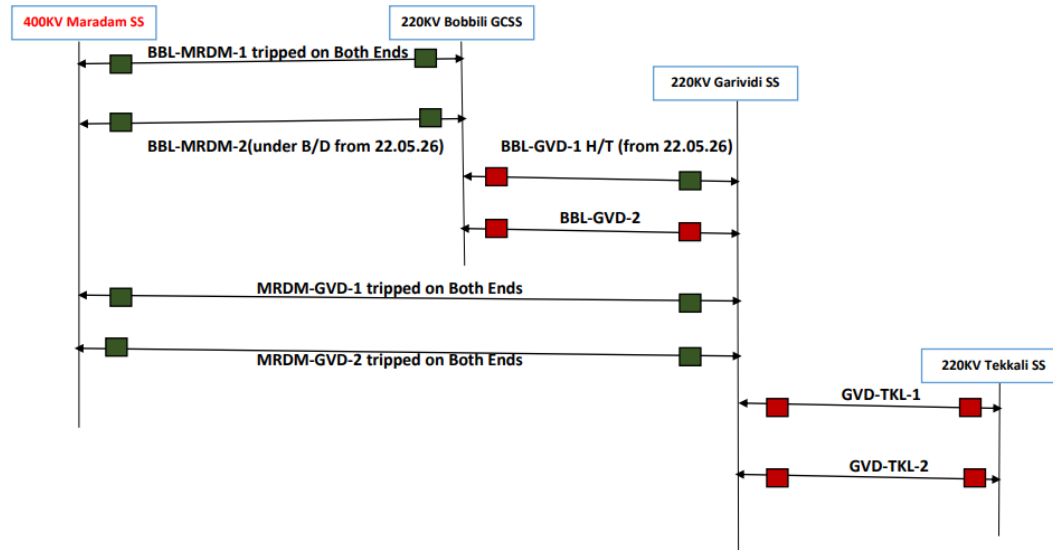
7. Duration of interruption (रुकावट की अवधि): 0 hours, 13 minutes

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):

Transmission Network connectivity during outage of 220KV Bobbili GC SS and 220KV Garividi SS on 23.05.2026



11. DR Analysis:

GARIVIDI - 220KV

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

BOBBILI - 220KV

	BOBBILI - 220KV
--	-----------------

Time Sync Issue	No
DR Analysis	Loss of power supply

TEKKALI - 220KV

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

220KV-GARIVIDI-MARADAM-1

	GARIVIDI - 220KV	MARADAM - 220KV
Time Sync Issue	No	Yes
DR Analysis	DR Trigger Time:23-05-2026 11:47:05.257 PHASE SELECT VOID BREAKER 1 CLOSED PHASE SELECT CG, PHASE SELECT SLG PHASE SELECT AB, PHASE SELECT MULTI-P SRC1 VT FF OP PHASE SELECT VOID PHASE SELECT AB, PHASE SELECT MULTI-P PHASE SELECT VOID BREAKER 1 OPEN PHASE SELECT AB, PHASE SELECT MULTI-P TRIPBUS 2 OP, AR LO	DR Trigger Time:23-05-2026 11:57:50.095 Z2 START, Z3 START, Z4 START GENERAL TR, TRIP BPH, Z1 TRIP, Z1 START, CS, 1 PH LBB AR START MCB B OP AR OPTD Ir (max): 0.98 kA Iy (max): 1.57 kA Ib (max): 5.33 kA Vr (max): 130.22 kV Vy (max): 130.00 kV Vb (max): 224.60 kV

	PHASE SELECT VOID PHASE SELECT MULTI-P AR BKR1 BLK PHASE SELECT VOID Ir (max): 0.93 kA Iy (max): 0.94 kA Ib (max): 0.02 kA Vr (max): 132.16 kV Vy (max): 133.87 kV Vb (max): 235.92 kV DR Trigger Time:23-05-2026 11:56:18.202 Z3 Z2 DIST Trip C, DIST. Chan Recv A/R 1P In Prog CB Aux C (52-B) Z3 A/R Trip 3P A/R Close CB Aux C (52-A) CB Aux C (52-B) CB Aux A (52-B), CB Aux B (52-B) A/R Lockout Ir (max): 1.01 kA Iy (max): 1.62 kA Ib (max): 1.54 kA Vr (max): 125.98 kV Vy (max): 128.79 kV Vb (max): 127.05 kV	
--	---	--

220KV-GARIVIDI-MARADAM-2

	GARIVIDI - 220KV	MARADAM - 220KV
Time Sync Issue	Yes	No

DR Analysis	DR Trigger Time:23-05-2026 11:55:29.582 Any Start Any Trip, DIST Trip C, DIST Fwd, Z1, Z2, Z3 Any Pole Dead Any Trip, SOTF/TOR Trip DIST Fwd Z1, Z2, Z3 Any Pole Dead All Pole Dead DIST. Chan Recv, DIST. Chan Recv, DIST UNB CR Ir (max): 0.64 kA Iy (max): 1.21 kA Ib (max): 5.73 kA Vr (max): 133.24 kV Vy (max): 129.75 kV Vb (max): 129.65 kV DR Trigger Time:23-05-2026 11:56:57.519 AR-START, BusAR INPROGR AR-PREP3P 86A_OPTD, 86B_OPTD AR BLOCK 86B_OPTD M_CB_B_OPEN M_CB_R_OPEN, M_CB_Y_OPEN CAR_REC_CH1 Ir (max): 0.62 kA Iy (max): 1.18 kA Ib (max): 5.60 kA Vr (max): 129.73 kV Vy (max): 127.00 kV Vb (max): 126.73 kV	DR Trigger Time:23-05-2026 11:56:18.360 T1 1ph Fault Z3 Z2 AR OPTD MAIN CB B PH CLS T1, 1ph Fault Any Trip, Any Trip A, Any Trip B, Any Trip C, Z1, DIST Sig. Send, SOTF/TOR Trip 86-2 OPTD, 86-2 OPTD Z2 Ir (max): 0.63 kA Iy (max): 1.21 kA Ib (max): 4.69 kA Vr (max): 131.86 kV Vy (max): 132.39 kV Vb (max): 131.88 kV
-------------	--	--

220KV-GARIVIDI-BOBBILI-1

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

220KV-GARIVIDI-BOBBILI-2

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

220KV-BOBBILI-MARADAM-1

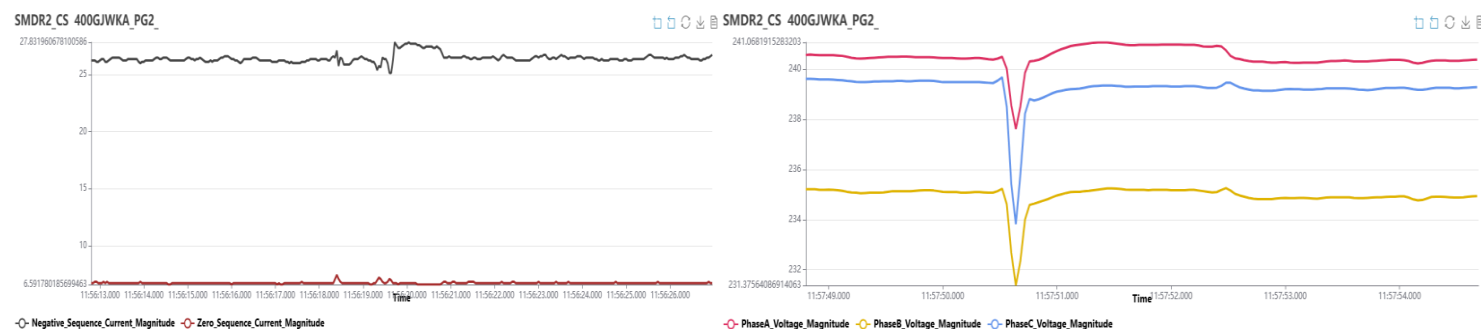
	BOBBILI - 220KV	MARADAM - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:23-05-2026 11:48:50.707 Any Start Z2 Any Trip, DIST Trip C, Z1, Any Int. Trip C DIST. Chan Recv, 6_CR RXD CH1/2, 3_CB B-PH OPEN A/R Close, A/R Reclaim SOTF Enable 3_CB B-PH OPEN Any Trip, Any Int. Trip A, Any Int. Trip B, Any Int. Trip C, AR Lockout Shot> DIST. Chan Recv, 6_CR RXD	DR Trigger Time:23-05-2026 11:48:50.222 Z2 START, Z3 START, Z4 START GENERAL TR, TRIP B PH, Z1 TRIP, Z1 START, CS, 1PH LBB IN MCB B OPEN CR Z2 START, Z3 START, Z4 START GENERAL TR, TRIP B PH, Z1 TRIP, Z1 START, CS, 1PH LBB IN AR BLOCK

	CH1/2 1_CB R-PH OPEN, 2_CB Y-PH OPEN Ir (max): 0.84 kA Iy (max): 1.78 kA Ib (max): 4.77 kA Vr (max): 133.96 kV Vy (max): 132.26 kV Vb (max): 131.45 kV DR Trigger Time:23-05-2026 11:48:50.734 EF Pickup, Relay PICKUP, Relay PICKUP L3, Relay PICKUP E Dis.Pickup L3, Dis.Pickup E, Dis. forward Relay TRIP L1, Relay TRIP L2, Relay TRIP L3, Relay TRIP	MCB B OPEN MCB R OPEN MCB Y OPEN Ir (max): 0.82 kA Iy (max): 1.73 kA Ib (max): 9.82 kA Vr (max): 129.53 kV Vy (max): 133.38 kV Vb (max): 161.73 kV
--	---	---

220KV-BOBBILI-MARADAM-2

	BOBBILI - 220KV	MARADAM - 220KV
Time Sync Issue	No	No
DR Analysis	Under shutdown	Under shutdown

12. A) PMU Analysis:





From PMU dip in B-phase voltage is observed at 11:48hrs, 11:56hrs and 11:57hrs with no delayed fault clearance during the event.

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

Constituent	Points for review
APTRANSCO	1. Hand tripping of 220kV Garividi Bobbili Line-1 to limit Load on 220kV Bobbili- Maradam-1 Line needs review. 2. Non operation of A/R in 220kV Maradam Bobbili Line-1 at Bobbili end. 3. Non operation of A/R in 220kV Maradam Garividi Line-1 at Garividi end.

14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil**15. RLDC Analysis/Observations (Based on Simulation Studies): NA****16. Restoration Details:**

Restored 220kV Supply to Garividi SS through 220kV Garividi-Maradam-1 feeder at 12:10hrs.

Restored 220kV Supply to Bobbili GC through 220kV Garividi-Bobbili GC-2 feeder at 12:10hrs.

Incoming Supply Restored to 220KV Tekkali SS from 220KV Garividi SS at 12:17hrs

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	APTRANSCO
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	APTRANSCO

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

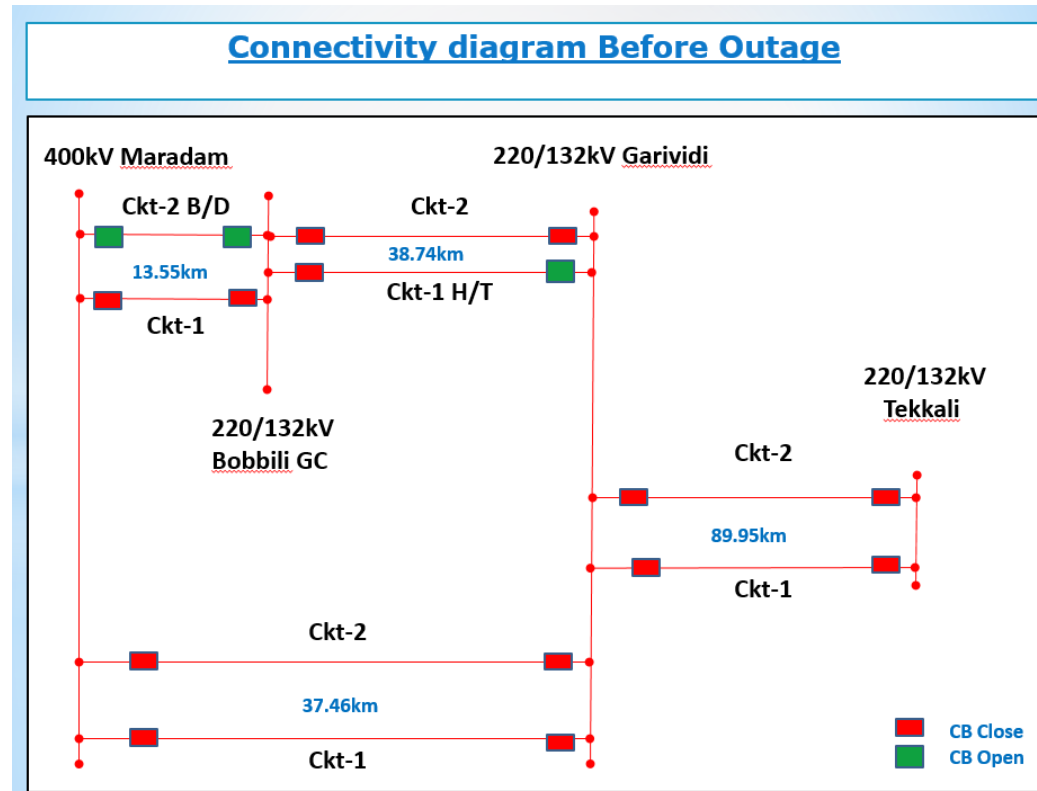
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
23-05-2026 11:48:53	BOBBILI CB 20452 (LINE-1 TO MRDM4) BETWEEN	BBLI2_AT
23-05-2026 11:48:56	BOBBILI CB 20452 (LINE-1 TO MRDM4) OPEN	BBLI2_AT
23-05-2026 11:59:02	GARIVIDI CB 10752 (LINE TO TBVR1) OPEN	GRVD2_AT
23-05-2026 12:02:29	BOBBILI CB 10252 (T2_S) OPEN	BBLI2_AT
23-05-2026 12:02:52	BOBBILI CB 10352 (T3_S) OPEN	BBLI2_AT
23-05-2026 12:10:04	BOBBILI CB 10452 (LOAD BFAL1) OPEN	BBLI2_AT
23-05-2026 12:10:50	BOBBILI CB 10752 (LOAD IFAL1) OPEN	BBLI2_AT
23-05-2026 12:12:43	TEKKALI CB 10352 (LOAD PLKN1) OPEN	TKLI2_AT
23-05-2026 12:12:48	TEKKALI CB 10452 (LOAD PNDR1) BETWEEN	TKLI2_AT

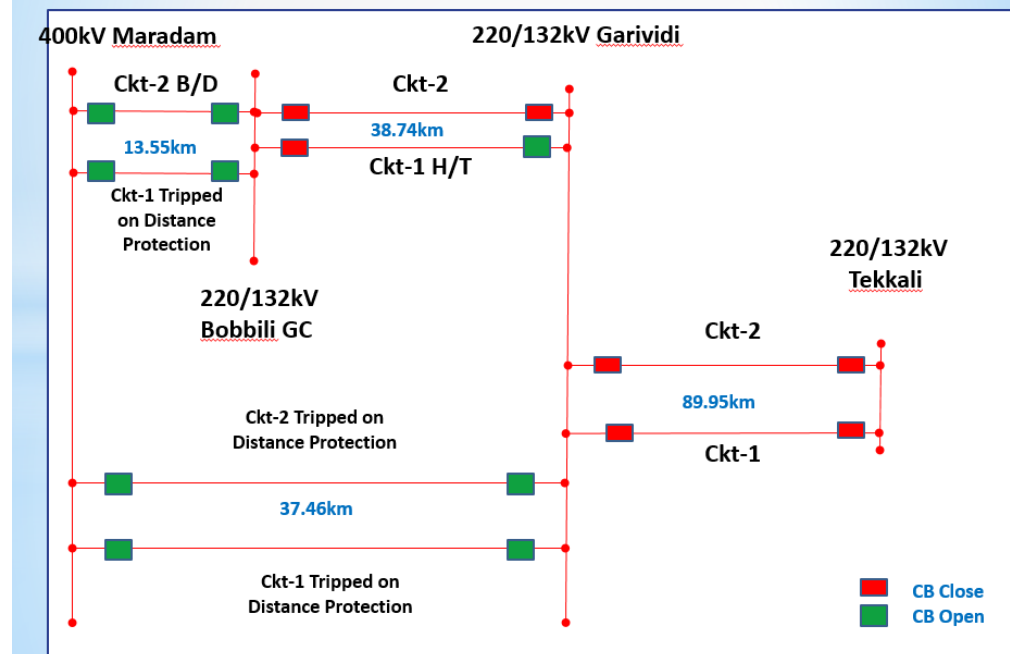
Deliberations:

1. APTRANSCO stated that, under antecedent conditions, the 220 kV Bobbili GC–Maradam Line-2 was under breakdown from 22.05.2026 at 18:31 hrs, following a fault that occurred during heavy gale and thunderstorm conditions, and restoration works were in progress at the time of the incident.
2. APTRANSCO further stated that the 220 kV Bobbili GC–Garividi Line-1 was hand tripped at the 220 kV Garividi end from 22.05.2026 at 23:48 hrs in order to limit the loading on the 220 kV Bobbili GC–Maradam Line-1.



3. APTRANSCO informed that, at 220 kV Bobbili GC Substation, the 220 kV Bobbili GC–Maradam Line-1 tripped at 11:48 hrs on B-phase Zone-1 Distance Protection. Auto Reclosure (A/R) operated successfully; however, the line subsequently tripped on Switch-On-To-Fault (SOTF) protection.

Connectivity diagram During Outage



4. APTRANSCO further stated that, at 220 kV Garividi Substation, the 220 kV Garividi–Maradam Line-2 tripped at 11:56 hrs on B-phase Zone-1 Distance Protection. Auto Reclosure operated, but the line subsequently tripped on SOTF. APTRANSCO attributed the incident to overloading of the line under severe heatwave conditions, which resulted in increased conductor sag.
5. APTRANSCO informed that, immediately thereafter, the only remaining source feeder, 220 kV Garividi–Maradam Line-1, also tripped at 11:57 hrs on B-phase Zone-1 Distance Protection, with the fault located at 17.5 km from the relay location. Auto Reclosure operated; however, the line tripped again subsequently. APTRANSCO stated that the tripping was also attributed to overloading coupled with severe heatwave conditions leading to conductor sag. Consequently, a complete outage of 220 kV Garividi Substation occurred, which in turn resulted in the outage of 220 kV Bobbili GC Substation. It was further informed that the associated 132 kV feeders tripped on Overcurrent Protection.
6. SRPC enquired regarding the non-successful Auto Reclosure of the 220 kV Bobbili GC–Maradam Line-1. APTRANSCO clarified that Auto Reclosure had operated successfully, however, after breaker reclosure, the Main-2 GE relay issued a trip command within 50 ms of breaker closing. SRPC requested APTRANSCO to refer the event to the OEM for detailed investigation and to furnish the OEM analysis report and findings to the forum.

Recommendations:

-  ***APTRANSCO to refer the event to OEM and furnish the report***
-  ***APTRANSCO to rectify the DR time sync issue at Garividi 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 Vattam SS of TGTRANSCO	During the antecedent conditions, 400 kV Yedula–Vattam Line-2 was under outage and 400 kV Vattam SS was being radially fed through 400 kV Yedula–Vattam Line-1. The triggering incident is the R-G fault in the line, during which OV St-2 was sensed at Vattam end and 3ph tripped and DT sent to remote end leading to 3ph tripped at Yedula end. Tripping of the only line connected to 400 kV Vattam SS, led to the complete outage of 400 kV Vattam SS of TGTRANSCO.	24-05-2026 03:19	0	0.4	GD - 1	11-06-2026	17-06-2026	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During the antecedent conditions, 400 kV Yedula–Vattam Line-2 was under outage and 400 kV Vattam SS was being radially fed through 400 kV Yedula–Vattam Line-1. The triggering incident is the R-G fault in the line, during which OV St-2 was sensed at Vattam end and 3ph tripped and DT sent to remote end leading to 3ph tripped at Yedula end. Tripping of the only line connected to 400 kV Vattam SS, led to the complete outage of 400 kV Vattam SS of TGTRANSCO.

2. Time and Date of the Event (घटना का समय और दिनांक): 24-05-2026 03:19

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Telangana State Demand (MW)	8749	8701

Telangana State Generation (MW)	3852	3836
Grid Frequency (Hz)	50.02	50.05
SR Demand (MW)	46305	46214
SR Generation (MW)	49987	49832

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

Elements under outage	1. 400KV-VATTEM-UDDANDAPUR-1 2. 400KV-VATTEM-UDDANDAPUR-2 3. 400KV-YEDULA-VATTEM-2
Weather Condition (मौसम स्थिति)	Normal

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	0.4 MW

7. Duration of interruption (रुकावट की अवधि): 3 hours, 7 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-YEDULA-VATTEM-1

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

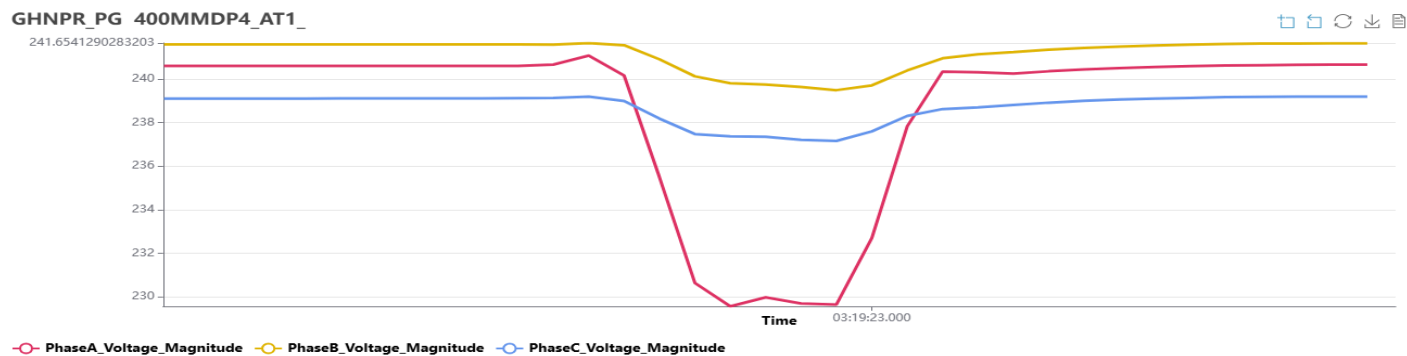
400kV Vatterm is connected through 400kV Yedula–Vatterm-1&2 as 400kV Vatterm-Uddandapur lines are still in commissioning stage. During the antecedent conditions, 400 kV Yedula–Vatterm Line-2 was under outage and hence 400 kV Vatterm SS was being radially fed through 400 kV Yedula–Vatterm Line-1.

DR Analysis	DR Trigger Time:24-05-2026 03:19:22.984 ZONE-2 START, ZONE-3 START, ZONE-4 START OV-1 START 86B OPTD TIE 86B OPTD Ir (max): 10.52 kA Iy (max): 0.28 kA Ib (max): 0.31 kA Vr (max): 246.18 kV Vy (max): 332.58 kV Vb (max): 314.14 kV	DR Trigger Time:24-05-2026 03:19:22.945 V>1 Start V>2 Start Any Trip, IM Output 4, V>2 Trip L23 T 86A OPTD L1 M 86A OPTD L18 T CB OPEN Y L17 T CB OPEN R, L19 T CB OPEN B L12 M CB OPEN R, L13 M CB OPEN Y, L14 M CB OPEN B Ir (max): 0.17 kA Iy (max): 0.13 kA Ib (max): 0.14 kA Vr (max): 249.26 kV Vy (max): 377.99 kV Vb (max): 341.81 kV
-------------	--	--

VATTEM - 400KV

	VATTEM - 400KV
Time Sync Issue	No
DR Analysis	Supply Failure.

12. A) PMU Analysis:



From PMU, dip in R-G fault is observed indicating R-G fault during the event with delayed fault clearance.

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

Constituent	Points for review
TGTRANSCO	1. Substantial increase in Y and B phases during the fault in R phase and leading to OV st-2 operation needs review.

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

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

16. Restoration Details:

24/05/2026 06:26

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

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

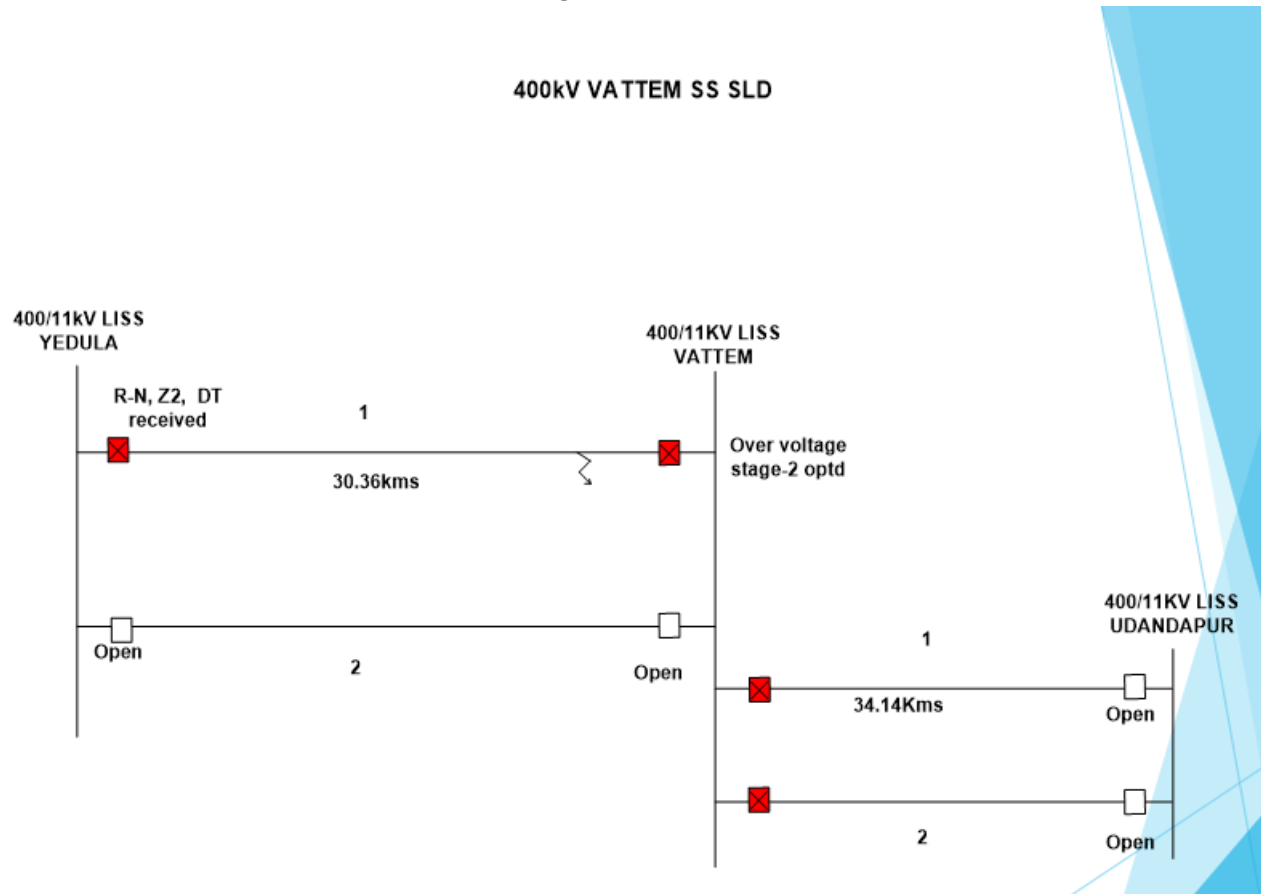
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
24-05-2026 03:19:37	VATTEM 400 CB TIE 11 - CB 41152 OPEN	VATM4_AT
24-05-2026 03:19:37	VATTEM 400 CB TIE 10 - CB 41052 OPEN	VATM4_AT
24-05-2026 03:19:37	VATTEM 400 CB TIE 05 - CB 40552 OPEN	VATM4_AT
24-05-2026 03:19:37	VATTEM 400 CB TIE 01 - CB 40152 OPEN	VATM4_AT
24-05-2026 03:19:37	VATTEM 400 CB TIE 04 - CB 40452 OPEN	VATM4_AT
24-05-2026 03:19:37	VATTEM 400 CB TIE 02 - CB 40252 OPEN	VATM4_AT

Deliberations:

1. TGTRANSCO stated that in the antecedent conditions the connectivity are as follows
 - 400kV Vatem-Udandapur-1 & 2 feeders are idle charged from Vatem end only.
 - 400kV Yedula-Vatem-2 feeder is in open condition at both ends.
 - 400kV Vatem SS is radially fed from 400kV Yedula SS through Yedula-Vatem-1 feeder.
2. On 24-05-2026 at 03:19Hrs, there was R-Phase to ground fault on 400KV Yedula-Vatem-1 feeder for which Zone-2 initiated at Yedula end



3. TGTRANSCO stated that, for the above fault, the Distance Protection at 400 kV Vatem Substation did not pick up, as the 400 kV Vatem Substation was operating under radial system conditions.
4. TGTRANSCO further informed that, during the disturbance, Over Voltage Stage-1 and Stage-2 protections picked up in the healthy phases at the Vatem end. After an intentional time delay of 100 ms, Over Voltage Stage-2 protection operated and tripped the breaker at the Vatem end, following which a Direct

Transfer Trip (DTT) signal was transmitted to the Yedula end.

5. TGTRANSCO stated that the Direct Transfer Trip signal was received within the Zone-2 operating time and the breaker tripped successfully at the Yedula end. It was further informed that no Lift Irrigation Scheme (LIS) loads were connected during the above tripping incident.
6. TGTRANSCO informed that the following remedial measures had been taken:
 - Existing relays on 400kV Vатtem-Yedula-1&2 feeders are of LDPs.
 - On 400kV Yedula-Vатtem Circuit-2, the LDPs were commissioned.
 - LDPs will be commissioned by availing LC for Circuit-1 feeder.
7. SRPC enquired regarding the reason for the overvoltage observed during the event and suggested that the neutral grounding at Vатtem Substation be verified. TGTRANSCO stated that the neutral grounding system at the Vатtem end has been verified and found to be healthy and intact.
8. SRPC further enquired regarding the cause of the high overvoltage observed during the incident and requested TGTRANSCO to carry out a detailed analysis of the event and furnish a comprehensive report on the reasons for the overvoltage to SRPC and SRLDC.

Recommendations:

-  **TGTRANSCO to submit the reasons for over voltage occurred at Vатtem end during the Incident along with proper detailed analysis.**

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 of 230kV NTPC Ettayapuram of NTPC	230kV NTPC_Ettayapuram is radially connected to TTGS through 230KV-TTGS-Ettayapuram-1 line. As per the reports submitted, the triggering incident was B-G fault in 230KV-TTGS-Ettayapuram-1 line and the line tripped. Tripping of the only connected line led to complete outage of 230kV NTPC Ettayapuram of NTPC.	24-05-2026 13:21	144	0	GD - 1	01-06-2026	25-05-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

230kV NTPC_Ettayapuram is radially connected to TTGS through 230KV-TTGS-Ettayapuram-1 line. As per the reports submitted, the triggering incident was B-G fault in 230KV-TTGS-Ettayapuram-1 line and the line tripped. Tripping of the only connected line led to complete outage of 230kV NTPC Ettayapuram of NTPC.

2. Time and Date of the Event (घटना का समय और दिनांक: 24-05-2026 13:21

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)	15463	15482
TamilNadu State Generation (MW)	14629	14644
Grid Frequency (Hz)	49.98	49.95
SR Demand (MW)	51834	51745
SR Generation (MW)	57179	57286

***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	144.0 MW	0.0 MW
Wind	0.0 MW	
Others	0.0 MW	
Total	144.0 MW	

7. Duration of interruption (रुकावट की अवधि): 7 hours, 42 minutes

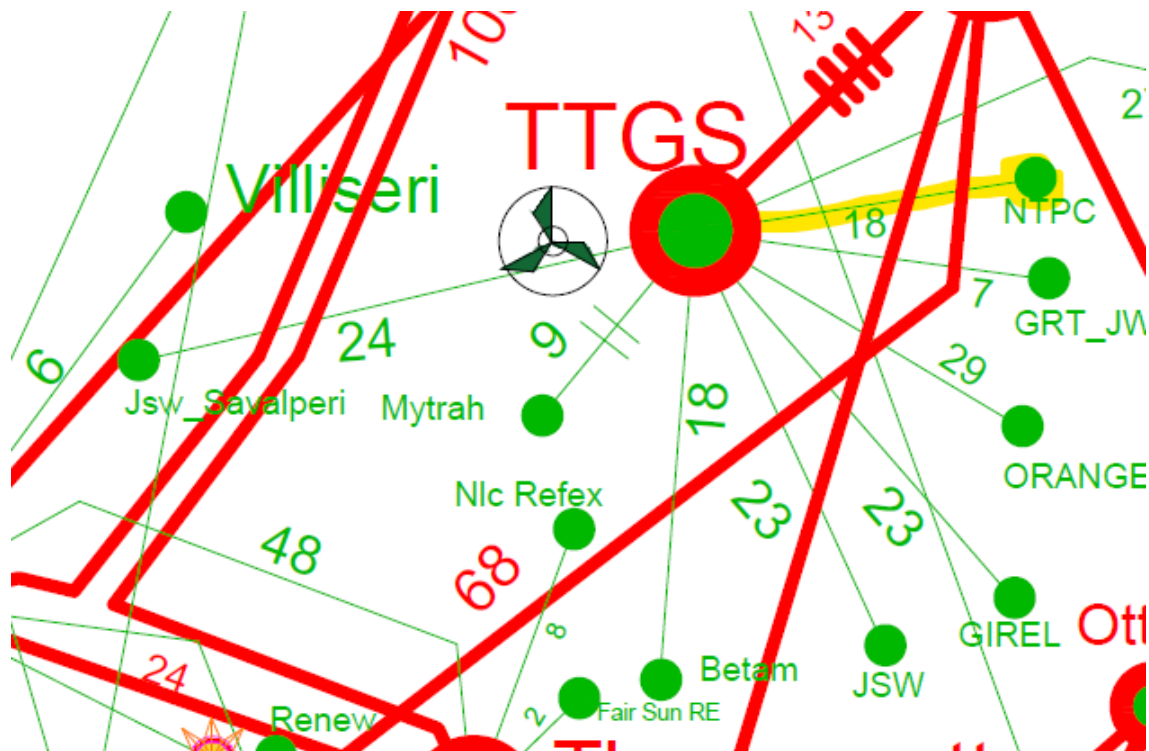
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 230KV-TTGS-Ettayapuram-1

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

230kV NTPC_Ettayapuram is radially connected to TTGS through 230KV-TTGS-Ettayapuram-1 line. As per the reports submitted, the triggering incident was B-G fault in 230KV-TTGS-Ettayapuram-1 line due to the failure of jumper supporting insulator at tower no.30 due to inclement weather. At Ettayapuram end, the fault was sensed in Line differential protection and the line tripped and DT was sent to the remote end. At TTGS end, the fault was sensed in Line Differential protection operated and B-pole opened. However, after around 80ms DT was received from Ettayapuram end and 3ph tripped. Tripping of the only connected line led to complete outage of 230kV NTPC Ettayapuram of NTPC.



11. DR Analysis:

230KV-TTGS-Ettayapuram-1

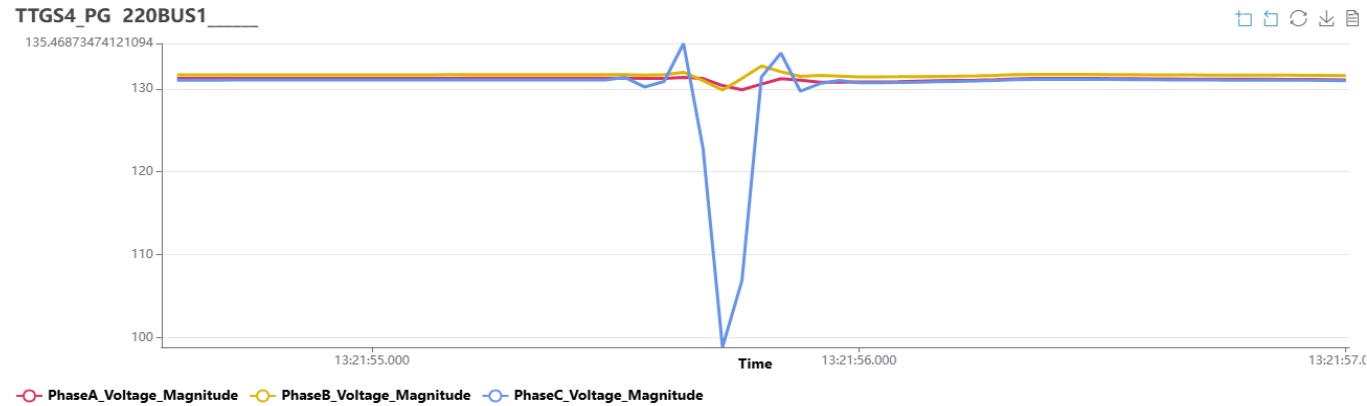
	TTGS - 230KV	Ettayapuram - 230KV
Time Sync Issue	No	Yes
DR Analysis	DR Trigger Time:24-05-2026 13:21:55.718 MAIN1_Z2_START, MAIN1_Z3_START, M1/2_CARR_SEND	DR Trigger Time:24-05-2026 06:27:28.247 Diff Trip, Trip Output C, R3 87L1 B TRIP, Diff Trip, Diff Trip C

	MAIN2_TRIP MAIN1_TRIP, Diff Trip, Diff Trip C MAIN_CB_B_OPEN DT_REC_CH1/2 3PH_GR_A/B_OPTD MAIN_CB_AR_LO MAIN_CB_R_OPEN, MAIN_CB_Y_OPEN Ir (max): 0.68 kA Iy (max): 0.54 kA Ib (max): 11.05 kA Vr (max): 133.00 kV Vy (max): 135.20 kV Vb (max): 132.64 kV	Diff InterTrip B8 CARR REC CH1 Aided 1 Receive B11 CARR REC CH2 B5 MCB B-PH OPEN B10 DT SEND CH1 B4 MCB Y-PH OPEN B3 MCB R-PH OPEN Ir (max): 0.68 kA Iy (max): 0.54 kA Ib (max): 0.78 kA Vr (max): 143.38 kV Vy (max): 139.48 kV Vb (max): 133.04 kV
--	--	---

Ettayapuram - 230KV

	Ettayapuram - 230KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:24-05-2026 06:27:28.247 Diff Trip, Trip Output C, R3 87L1 B TRIP, Diff Trip, Diff Trip C Diff InterTrip B8 CARR REC CH1 Aided 1 Receive B11 CARR REC CH2 B5 MCB B-PH OPEN B10 DT SEND CH1 B4 MCB Y-PH OPEN B3 MCB R-PH OPEN Ir (max): 0.68 kA Iy (max): 0.54 kA Ib (max): 0.78 kA Vr (max): 143.38 kV Vy (max): 139.48 kV Vb (max): 133.04 kV

12. A) PMU Analysis:



From PMU, dip in B-phase is observed indicating B-G fault during the event.

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

Constituent	Points for review
NTPC	1. Non operation of AR at Ettayapuram end needs review 2. Sending of DT to remote end for single phase fault needs review

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

Constituent	Remedial Actions
NTPC	At tower no.30, the jumper supporting insulator got detached from the supporting structure due to heavy whirlwind present at the time of fault. The jumper support insulator is fixed properly. Line is charged.

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

16. Restoration Details:

230KV-TTGS-Ettayapuram-1 tripped at 24/05/2026 13:21 and restored at 24/05/2026 21:03

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

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
24-05-2026 13:21:56	TUTICORIN GS CB 21152 (LINE TO ETYPM) INVALID	TTGS4_PG
24-05-2026 13:21:58	TUTICORIN GS CB 21152 (LINE TO ETYPM) OPEN	TTGS4_PG
24-05-2026 13:22:01	NTPC ETYARPURAM CB 20252 (LINE TO TTGS4) OPEN	ETYPM_CS
24-05-2026 13:22:06	NTPC ETYARPURAM CB 32652 (LOAD-26 FDR) OPEN	ETYPM_CS
24-05-2026 13:22:06	NTPC ETYARPURAM CB 31652 (LOAD-16 FDR) OPEN	ETYPM_CS
24-05-2026 13:22:06	NTPC ETYARPURAM CB 30552 (LOAD-5 FDR) OPEN	ETYPM_CS
24-05-2026 13:22:06	NTPC ETYARPURAM CB 32352 (LOAD-23 FDR) OPEN	ETYPM_CS
24-05-2026 13:22:06	NTPC ETYARPURAM CB 30252 (LOAD-2 FDR) OPEN	ETYPM_CS
24-05-2026 13:22:06	NTPC ETYARPURAM CB 32552 (LOAD-25 FDR) OPEN	ETYPM_CS

Deliberations:

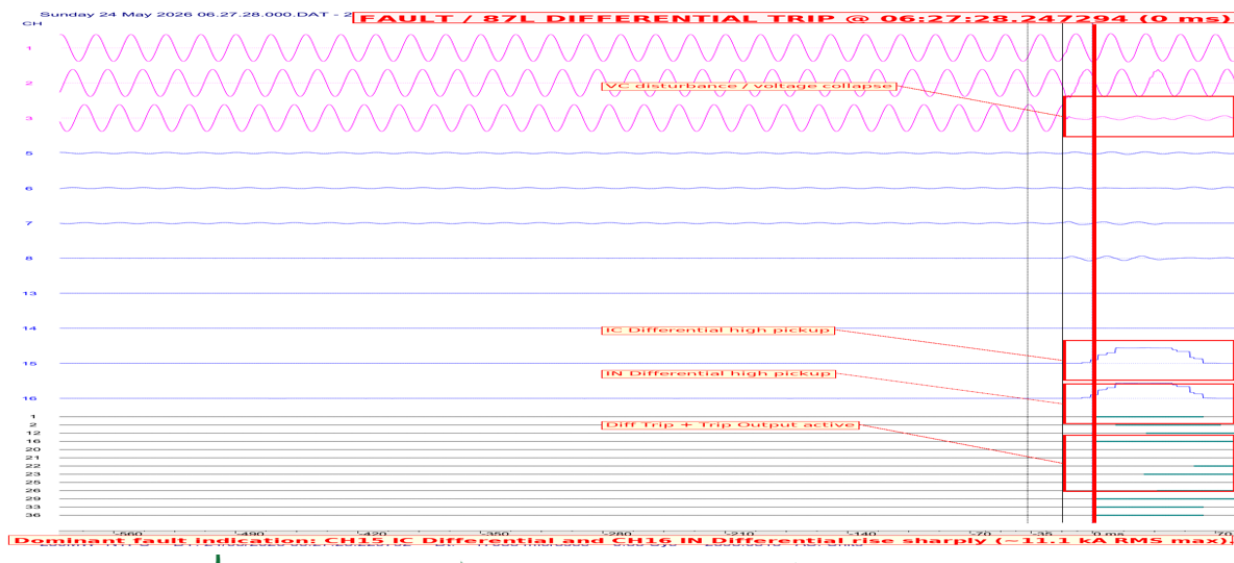
1. NTPC Ettayapuram stated that on 24.05.2026 at 13:22 hrs, a B-phase to ground fault occurred on the 230 kV Single Circuit transmission line. During post-fault inspection, it was observed that the Y-phase jumper support insulator at Tower No. 30 had detached and was hanging towards the B-phase conductor. The relay recorded the fault at a distance of 8.89 km from the plant end, with a fault current of 11.1 kA.
2. NTPC stated that the fault occurred due to heavy winds and rainfall prevailing at the time of the incident, which resulted in the detachment of the Y-phase jumper support insulator from Tower No. 30.

Rain & whirlwind at the time of fault- nearby area





Disturbance Record-P543



3. SRPC enquired regarding the reason for the Direct Transfer Trip (DTT) being sent to the remote end during the fault. NTPC stated that, following B-pole opening of the breaker, current was observed to persist in the B-phase, which resulted in the operation of the Local Breaker Backup (LBB) protection. Consequently, the Direct Transfer Trip signal was transmitted to the remote end. NTPC further informed that, due to the operation of LBB, Auto Reclosure (A/R) did not operate.
4. SRPC observed that, based on the Disturbance Recorder (DR) records, no B-phase current was seen after breaker opening. Accordingly, SRPC requested NTPC to re-verify the Auto Reclosure and LBB logic, consult the OEM, and furnish a detailed technical report on the operation of the protection scheme.
5. SRPC also highlighted the DR time synchronization issue observed during the event. NTPC informed the forum that the DR time synchronization issue had been rectified following the incident

Recommendations:

- ✚ NTPC –Ettayapuram to review the Auto reclosure & LBB logic at Ettayapuram end.
- ✚ NTPC-Ettayapuram to refer the event to OEM and furnish a detailed report in this regard.
- ✚ NTPC-Ettayapuram to rectify the DR time sync issue at their end.

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 Exora SS, 220kV Vikas Tech and 220kV Bus-1 Outage at 220kV Malur SS of KPTCL	220kV Malur SS was operating with split bus condition with 220kV Hoody Malur line feeding 220kV Malur Bus-1. 220kV/66kV Exora and 220kV/66kV Vikas Tech Park were being radially fed from 220kV Malur Bus-1. As per the reports submitted, the triggering incident was Y-G fault in 220kV Hoody Malur line and the line tripped. Tripping of this line led to loss of power supply to 220kV Malur Bus-1 which in turn led to complete outage of 220kV Exora SS and 220kV Vikas Tech Park.	29-05-2026 17:35	0	143	GD - 1	10-06-2026	02-06-2026 & 03-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV Malur SS was operating with split bus condition with 220kV Hoody Malur line feeding 220kV Malur Bus-1. 220kV/66kV Exora and 220kV/66kV Vikas Tech Park were being radially fed from 220kV Malur Bus-1. As per the reports submitted, the triggering incident was Y-G fault in 220kV Hoody Malur line and the line tripped. Tripping of this line led to loss of power supply to 220kV Malur Bus-1 which in turn led to complete outage of 220kV Exora SS and 220kV Vikas Tech Park.

2. Time and Date of the Event (घटना का समय और दिनांक): 29-05-2026 17:35

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)	12433	12244
Karnataka State Generation (MW)	7473	7483
Grid Frequency (Hz)	50.33	50.31
SR Demand (MW)	55988	55584
SR Generation (MW)	49263	49121

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

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

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-HOODY-MALUR-1 2. 220KV-MALUR-EXORA-1	1. 220KV-KOLAR_KAR-MALUR-1 2. 220KV-KOLAR_KAR-MALUR-2 3. 220KV-KOLAR_KAR-MALUR-3

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	143.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 40 minutes

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

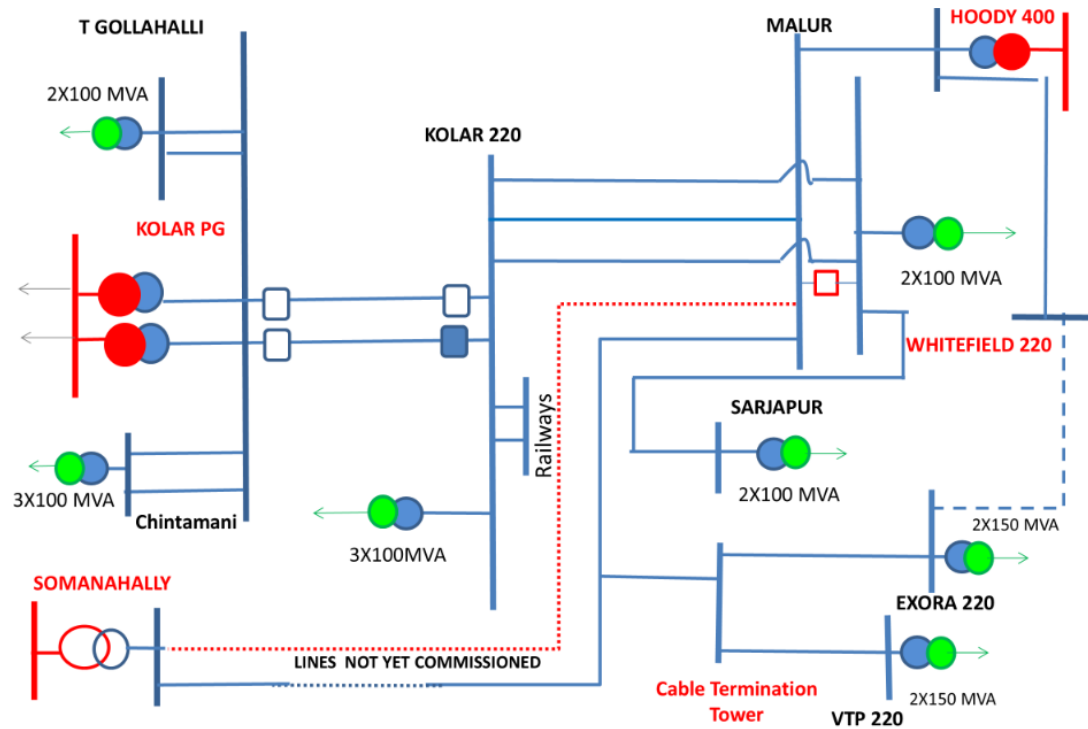
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-HOODY-MALUR-1

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

220kV Malur SS was operating with split bus condition with 220kV Hoody Malur line feeding 220kV Malur Bus-1. 220kV/66kV Exora and 220kV/66kV Vikas

Tech Park were being radially fed from 220kV Malur Bus-1 as shown below.



As per the reports submitted, the triggering incident was Y-G fault in 220kV Hoody Malur line. At both ends, the fault was sensed in Z1 and since AR is disabled 3ph tripped. Tripping of this line led to loss of power supply to 220kV Malur Bus-1 which in turn led to complete outage of 220kV Exora SS and 220kV Vikas Tech Park.

11. DR Analysis:

VIKAS_TECH_PARK - 220KV

	VIKAS_TECH_PARK - 220KV
Time Sync Issue	No
DR Analysis	Supply Failure. No DR triggered

EXORA - 220KV

	EXORA - 220KV
Time Sync Issue	No
DR Analysis	Supply Failure. No DR triggered

MALUR - 220KV

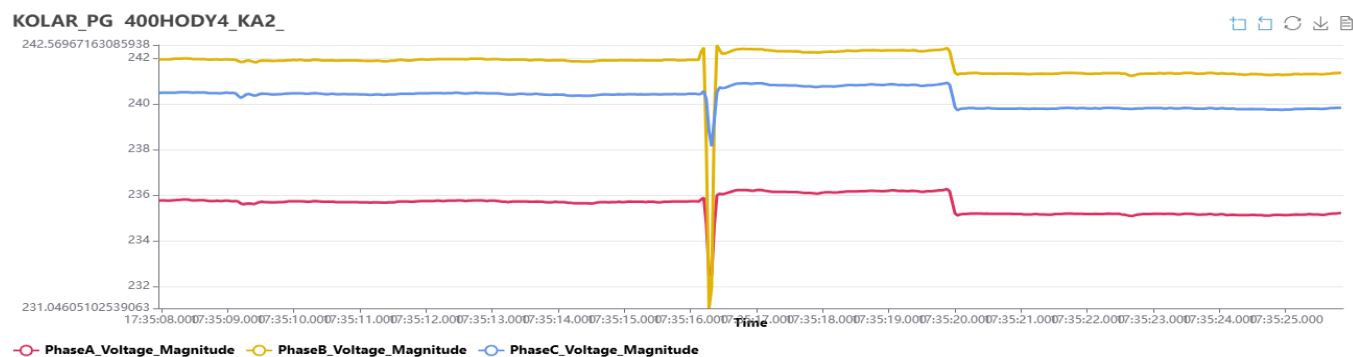
	MALUR - 220KV
Time Sync Issue	No
DR Analysis	Supply Failure. No DR triggered

220KV-HOODY-MALUR-1

	HOODY - 220KV	MALUR - 220KV
Time Sync Issue	Yes	Yes
DR Analysis	DR Trigger Time:29-05-2026 17:35:22.231 Z1, DIST Trip B, Z2, DIST Sig. Send 13_86_OPTD DIST. Chan Recv Ir (max): 0.98 kA Iy (max): 8.95 kA Ib (max): 0.40 kA Vr (max): 125.54 kV Vy (max): 126.71 kV Vb (max): 126.76 kV DR Trigger Time:29-05-2026 17:35:22.232 PH_SEL_ST_FW, PH_SEL_ST_ND Z1_OPTD, M2_YPH_OPTD, ZONE_2_START, DIST_ST_ND,	DR Trigger Time:29-05-2026 17:33:17.846 Any Trip, DIST Trip B, Any Trip C, Z1, Z2, Z3, 10.CARR SEND-2 8.86 A/B OPTD, 8.86 A/B OPTD 6.CR REC 1/2 Ir (max): 0.98 kA Iy (max): 0.85 kA Ib (max): 0.39 kA Vr (max): 131.26 kV Vy (max): 125.36 kV Vb (max): 132.08 kV

	M2_CAR_SEND 86_OPTD CAR_REC1/2 ZCOM_OPTD Ir (max): 0.97 kA Iy (max): 8.78 kA Ib (max): 0.39 kA Vr (max): 125.86 kV Vy (max): 126.93 kV Vb (max): 126.80 kV	
--	---	--

12. A) PMU Analysis:



From PMU, dip in Y-G fault is observed indicating Y-G fault during the event with no delayed fault clearance.

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

Constituent	Points for review
KPTCL	1. Tapping of EXORA and VIKAS_Tech_Park at 220kV level needs review

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

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

16. Restoration Details:

29/05/2026 18:15

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)	
4	Any other non-compliance	IEGC section 17.3	KPTCL

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

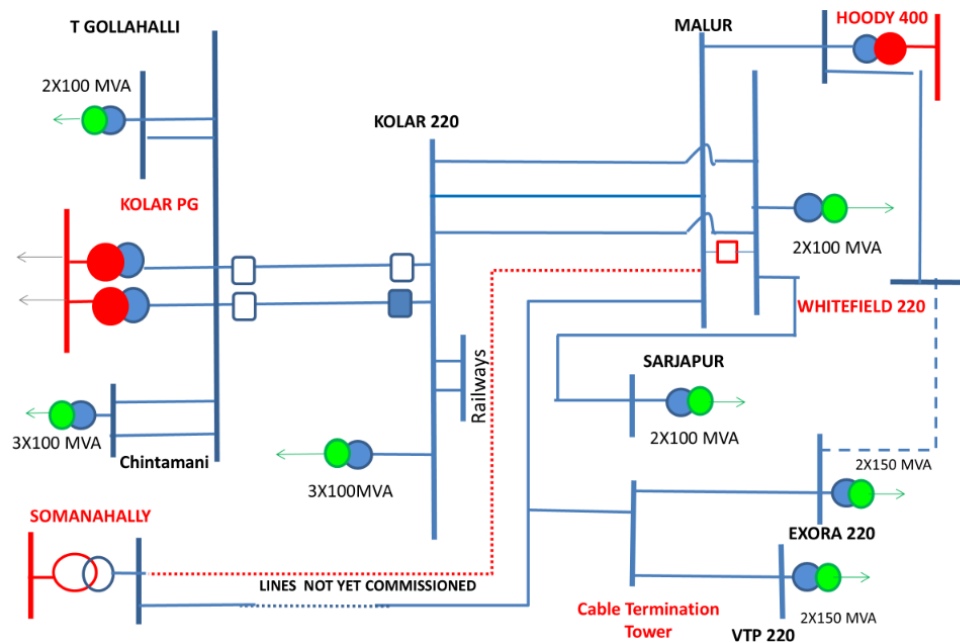
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
29-05-2026 17:35:18	HOODY 400 CB 21352 (LINE TO MALUR) OPEN	HODY4_KA
29-05-2026 17:35:22	MALUR CB 20152 (LINE TO HODY4) BETWEEN	MALUR_KA
29-05-2026 17:35:23	MALUR CB 20152 (LINE TO HODY4) OPEN	MALUR_KA

Deliberations:

1. KPTCL stated that, under the pre-fault scenario, 220 kV Malur Substation was operating in split bus configuration, with the 220 kV Hoody line connected to Bus-1, radially feeding the 220 kV Exora and 220 kV Vikas Tech Park substations.



2. KPTCL informed that at 17:35 hrs, the 220 kV Hoody–Malur line tripped at the Hoody end on Y-phase to ground fault, with a recorded fault current of 8.64 kA and an indicated fault location of 16.7 km from the Hoody end. The tripping of the line resulted in loss of supply to 220 kV Malur Bus-1, leading to the complete outage of 220 kV Exora and 220 kV Vikas Tech Park substations.
3. SRPC enquired about the nature of the fault. KPTCL stated that the fault was suspected to be transient in nature, caused by heavy winds and rainfall. It was further informed that the 220 kV Hoody–Malur line was test charged at 18:10 hrs and was found to be healthy.
4. **Remedial Measures taken:** Line inspection was carried out on 30.05.2026 and tree trimming was carried out at tower location 61 and 62. Alternate source to Exora is envisaged from Hagadur 220kV SS. Along with commissioning of 400/220kV Dommasandra SS, VTP and Exora will have source from Dommasandra 400/220kV SS which will improve reliability of power supply to these substations.
5. SRPC highlighted the Disturbance Recorder (DR) time synchronization issues observed at Hoody and Malur substations. KPTCL informed that the DR time synchronization issues at both substations have since been rectified.
6. SRPC enquired regarding the non-operation of Auto Reclosure (A/R) during the event. KPTCL stated that Auto Reclosure has not been enabled for transmission lines within city limits, considering public safety concerns.

Recommendations:

 ***KPTCL to rectify the DR time sync issue at 220kV Malur SS***

 ***KPTCL to avoid Tap at 220kV level for Malur-Somanahally Line.***

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 220kV Rychalu SS of KSPDCL	As per the reports submitted, the triggering incident was B-G fault in 220kV Pavagada Rychalu Line-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Rychalu SS of KSPDCL	29-05-2026 23:59	0	0	GD - 1	06-07-2026	07-07-2026	Not 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 B-G fault in 220kV Pavagada Rychalu Line-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Rychalu1 SS of KSPDCL

2. Time and Date of the Event (घटना का समय और दिनांक): 29-05-2026 23:59

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)	8653	8615
Karnataka State Generation (MW)	6235	6182
Grid Frequency (Hz)	50.05	50.06
SR Demand (MW)	52257	52094
SR Generation (MW)	48817	48724

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

11. DR Analysis:

220KV-PAVAGADA_PG-RYCHALU1

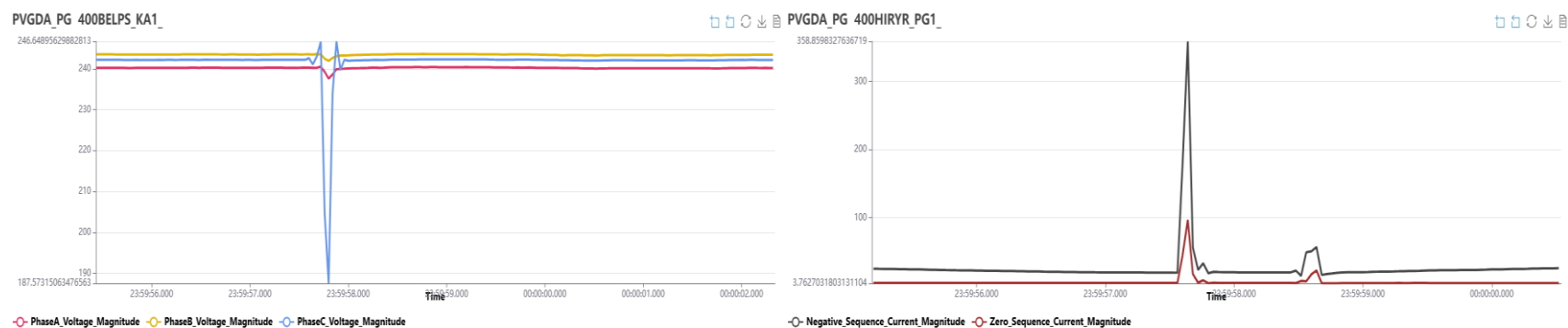
	PAVAGADA_PG - 220KV	RYCHALU1 - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:29-05-2026 23:59:57.300 Relay PICKUP 21 Pickup ØC, Relay PICKUP ØC, Relay PICKUP G, Relay TRIP ØA, Relay TRIP ØB, Relay TRIP ØC, Relay TRIP >Trig.Wave.Cap., M2_TRIP, M1Z1_OP, M1Z2_ST, M1Z3_ST, M12CRSD GRA/B_OPD Ir (max): 1.54 kA Iy (max): 1.55 kA Ib (max): 25.68 kA Vr (max): 133.01 kV Vy (max): 134.23 kV Vb (max): 133.33 kV	DR Trigger Time:29-05-2026 23:59:57.785 Diff Trip Trip Output C, R3 CON MUL B, R6 M CB TC1 B V<1 Trip R7 86A TRIP, A/R Lockout Diff InterTrip Trip Output A, Trip Output B L13 AR LO Ir (max): 1.54 kA Iy (max): 1.54 kA Ib (max): 1.55 kA Vr (max): 134.50 kV Vy (max): 135.82 kV Vb (max): 134.72 kV DR Trigger Time:29-05-2026 23:59:57.791 Dis.Pickup L3, Relay PICKUP, Relay PICKUP L3, Relay PICKUP E Dis.T.SEND, Dis.TripZ1/1p, Relay TRIP L3, Relay TRIP >Trig.Wave.Cap. >BF Start L3 >BF Start 3pole 2nd Harmonic L1, 2nd Harmonic L2, 2nd Harmonic L3 Ir (max): 1.53 kA Iy (max): 1.53 kA

		Ib (max): 1.54 kA Vr (max): 134.54 kV Vy (max): 135.80 kV Vb (max): 134.65 kV
--	--	---

RYCHALU1 - 220KV

	RYCHALU1 - 220KV
Time Sync Issue	No
DR Analysis	Loss of power supply

12. A) PMU Analysis:



From the PMU plot, B-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
PGCIL SR-2	Non operation of A/R at Pavagada end
KSPDCL	Non operation of A/R at Rychalu end

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

GDs and GIs discussed during 144th PCSC meeting held on 08.07.2026

Constituent	Remedial Actions
KSPDCL	After proper inspection of the entire 220kV line, it is found that there was no visual fault. So the the line CB is test charged at PGCIL end it stood OK. So it is concluded that the fault occurred was transient in nature.

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

16. Restoration Details: 30/05/2026 02:58

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)	KSPDCL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	KSPDCL
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	KSPDCL
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
29-05-2026 23:59:59	PAVAGADA SS CB 20852 (LINE TO RCLU2) OPEN	PVGDA_PG

Deliberations:

1. KSPDCL stated that in the antecedent conditions the weather conditions are Rainy, Thunders & Windy.
2. KSPDCL stated that on 29-05-2026 at 23:59 B-G fault occurred in the line. At both ends, the fault was sensed in zone-1 and LDP operated and the line tripped. A/R did not operate at both ends. Tripping of the only connected line led to complete outage of 220kV Rychalu SS.
3. SRPC enquired about the reason for non operation of Auto reclosure. KSPDCL stated that Auto reclosure wiring is ongoing and they are in contact with KPTCL to enable Auto reclosure at earliest.

Recommendations:

 **KSPDCL to enable Auto reclosure at Rychallu 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
8	Complete Outage of 220kV KANKAPURA, HAROHALLI, KIADB-HAROHALLI of KPTCL	In the antecedent conditions, 220kV KANKAPURA-TK HALLI was under idle charged condition and hence 220kV KANKAPURA, HAROHALLI, KIADB-HAROHALLI were radially connected through 220KV-HAROHALLI-SOMANAHALLI-1. The triggering incident is the R-G fault in 220KV-HAROHALLI-SOMANAHALLI-1 line and the line tripped. Tripping of the only line connected led to the Complete Outage of 220kV KANKAPURA, HAROHALLI, KIADB-HAROHALLI of KPTCL	31-05-2026 19:47	0	92	GD - 1	15-06-2026	04-06-2026 08-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

In the antecedent conditions, 220kV KANKAPURA-TK HALLI was under idle charged condition and hence 220kV KANKAPURA, HAROHALLI, KIADB-HAROHALLI were radially connected through 220KV-HAROHALLI-SOMANAHALLI-1. The triggering incident is the R-G fault in 220KV-HAROHALLI-SOMANAHALLI-1 line and the line tripped. Tripping of the only line connected led to the Complete Outage of 220kV KANKAPURA, HAROHALLI, KIADB-HAROHALLI of KPTCL

2. Time and Date of the Event (घटना का समय और दिनांक): 31-05-2026 19:47

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)	10126	10154
Karnataka State Generation (MW)	6759	6853
Grid Frequency (Hz)	49.91	49.95
SR Demand (MW)	49828	49877
SR Generation (MW)	43312	43421

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

Elements under outage	1. 220KV-KANKAPURA-TK_HALLI-1
Weather Condition (मौसम स्थिति)	Thunders

Bus Configuration at Somanahally 220KV Substation and elements under tripped condition in Prefault condition are as follows:

220kV Bus A:

Section 1 : 500MVA ICT-1,Tataguni and Harohalli lines

Section 2: Lines Mylasandra-1,Mylasandra-2,Keonics city, Khodays, 500MVA ICT 2 & 3, Bus Sectionaliser was in closed condition.

220kV Bus B:

Lines Bidadi-1,Bidadi-2, Malur (idle charged) line and local load of Somanahally, Bus Sectionaliser was in closed condition.

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	92.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 20 minutes

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

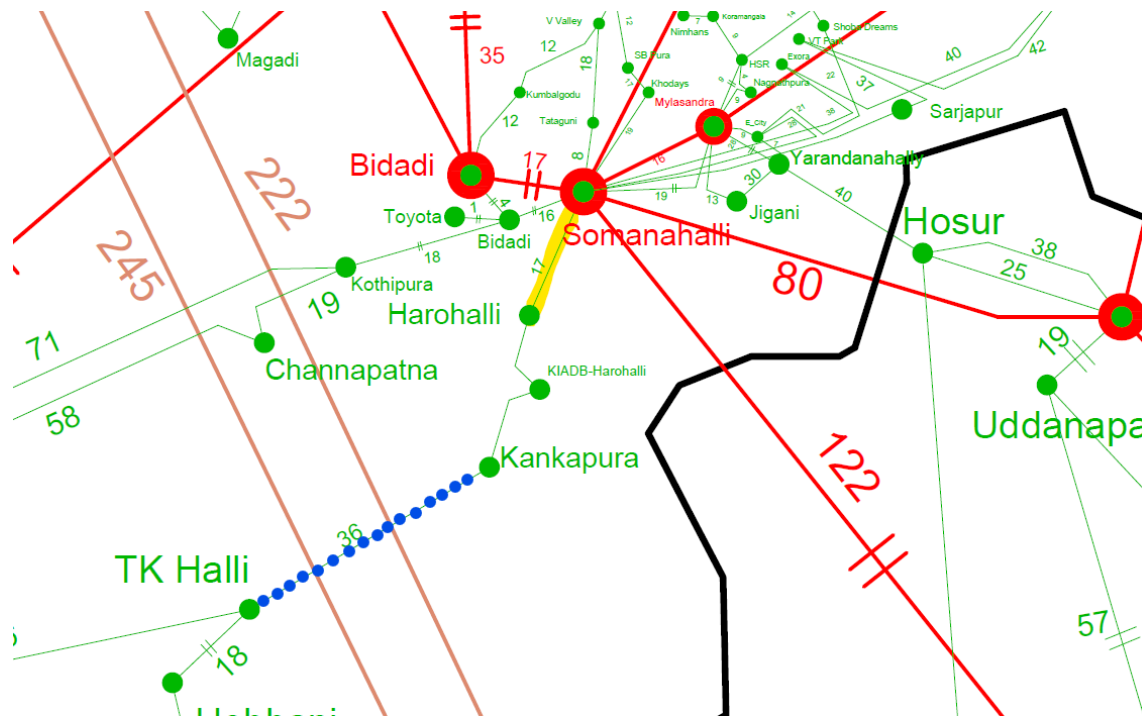
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-HAROHALLI-SOMANAHALLI-1

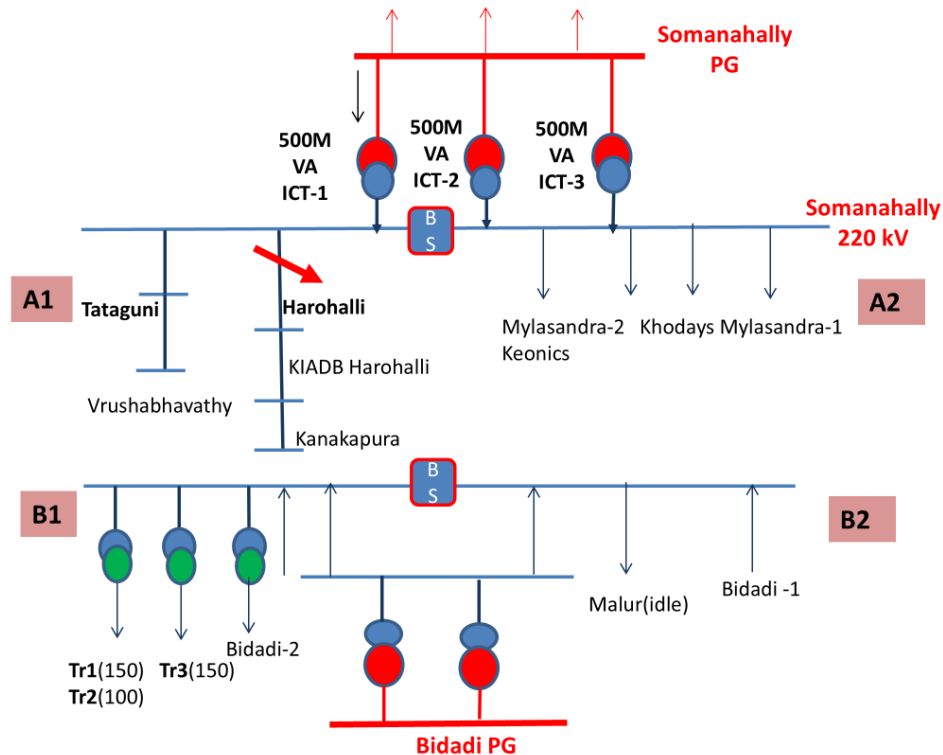
10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

In the antecedent conditions, 220kV KANKAPURA-TK HALLI was under idle charged condition and hence 220kV KANKAPURA, HAROHALLI, KIADB-

HAROHALLI were radially connected through 220KV-HAROHALLI-SOMANAHALLI-1.



Complete outage of 220kV Harohalli, KIADB-Harohalli and Kanakapura SS & Tripping of Bus sectionaliser (A1-A2) at Somanahally 220kV SS occurred on 31.05.2026 at 19:47 Hrs



At Somanahally Bus configuration is shown as above. As per the reports submitted, the triggering incident was R-G fault at 220 kV Somanahalli - Harohalli line. At Somanahally end, the fault was sensed in Z2 without receiving carrier aided trip signal due to fault not being detected at remote end and Z2 time tripped after around 430ms. During the same time the Bus-1 bus sectionaliser also tripped on EF protection (pick up 320A, TMS 0.15) as per FIR. Due to the Tripping of the only line resulted in complete outage of 220kV Harohalli, KIDAB-Harohalli and Kankapura of KPTCL.

11. DR Analysis:

KIADB-HAROHALLI - 220KV

	KIADB-HAROHALLI - 220KV	KIADB-HAROHALLI - 220KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded.	No DR uploaded.

KANKAPURA - 220KV

	KANKAPURA - 220KV	KANKAPURA - 220KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded.	No DR uploaded.

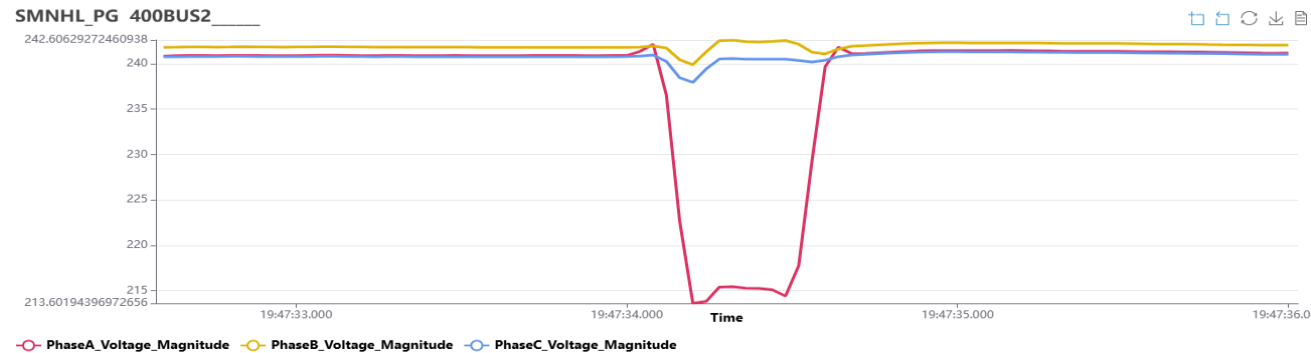
220KV-HAROHALLI-SOMANAHALLI-1

	HAROHALLI - 220KV	SOMANAHALLI - 220KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded.	DR Trigger Time:31-05-2026 19:47:34.194 Relay Startup A_Phase Trip, B_Phase Trip, C_Phase Trip, 3_Phase Trip, PSB, Zone2 OPTD DI CBF C_PH DI_A/R Block, DI CBF B_PH CB Open B_Phase, CB Open C_Phase CB Open A_Phase

HAROHALLI - 220KV

	HAROHALLI - 220KV
Time Sync Issue	No
DR Analysis	No DR uploaded.

12. A) PMU Analysis:



From the PMU plot, R-G fault is observed during the event with delayed fault clearance of around 400ms

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

Constituent	Points for review
KPTCL	1. Delayed fault clearance during the fault in 220KV-HAROHALLI-SOMANAHALLI-1 needs review 2. Tripping of BS at SOMANAHALLI during the fault in 220KV-HAROHALLI-SOMANAHALLI-1 needs review

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

Constituent	Remedial Actions
KPTCL	Line inspection carried out by TLM Kanakapura, No fault found, as per the request of TLM JE Kanakapura line was test charged at 220kV Somanahalli at 20:07 Hrs. Line Immediately tripped on SOTF at 220kV Somanahalli. Load of 220kV BWSSB Harohalli was changed over to 220kV Station TK Halli at 20:08 Hrs, and 220kV KIADB Harohalli load was changed over to 220 kV Kanakapura station at 20:09 Hrs.

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

16. Restoration Details:

Load restored to Kanakapura, Harohalli and KIADB Harohalli at 20:09 hrs by charging 220kV TK Halli-Kanakapura line.

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	

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

Annexure 1

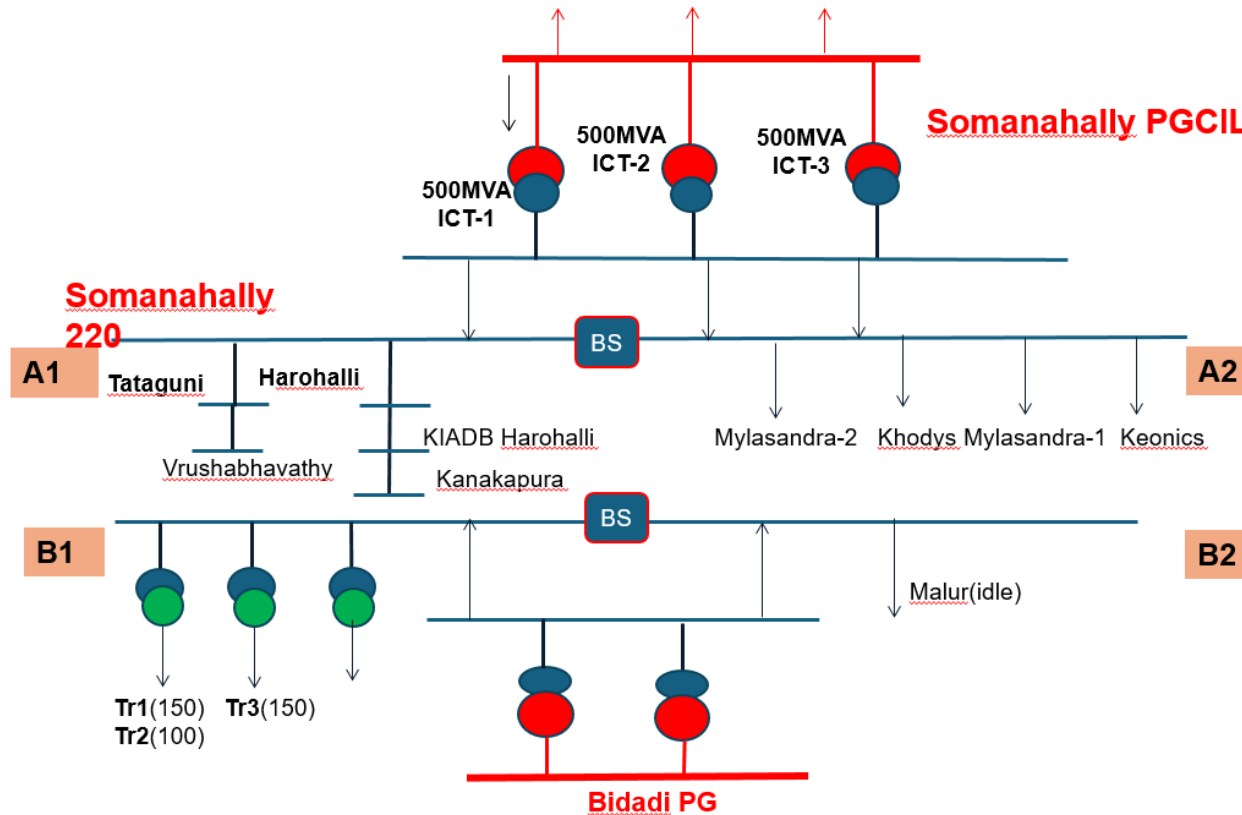
Sequence of Events as per SCADA

time	Event	Location
31-05-2026 19:47:40	SOMANAHALLI CB 20152 (LINE TO SRJPR) OPEN	SMNHL_KA

Deliberations:

1. KPTCL stated that, under antecedent conditions, the 220 kV Somanahalli Substation was operating with the following bus configuration:
 - **Bus-A Section-1:** 500 MVA ICT-1, Tataguni Line and Harohalli Line.
 - **Bus-A Section-2:** Mylasandra Line-1, Mylasandra Line-2, Keonics City Line, Khodays Line, 500 MVA ICT-2, 500 MVA ICT-3, with the **Bus Sectionaliser** in the closed condition.
 - **Bus-B:** Bidadi Line-1, Bidadi Line-2, local load of **220 kV Somanahalli Substation**, and the **220 kV Malur Line** (idle charged), with the **Bus Sectionaliser** in the closed condition.

SOMANAHALLY CONNECTIVITY SETCH



2. KPTCL informed that the 220 kV Kanakapura–TK Halli Line was in the idle charged condition from the Kanakapura end. Consequently, 220 kV BWSSB Harohalli, KIADB Harohalli, and Kanakapura Substations were being radially fed from the Somanahalli source through the 220 kV Somanahalli–Harohalli

Line.

3. KPTCL stated that on 31.05.2026 at 19:47:34 hrs, at 220 kV Somanahalli Substation, the 220 kV Harohalli Line tripped on R-phase to ground fault detected in Zone-2. The fault location was indicated as 16.88 km, with a recorded R-phase fault current of 9.7 kA. Owing to non-receipt of the carrier signal under radial operating conditions, the circuit breaker tripped after approximately 360 ms. During the same disturbance, the Bus-A Bus Sectionalizer tripped on Non-Directional Earth Fault (NDEF) protection, with a recorded fault current of 3.07 kA, and the breaker operated after approximately 325 ms. The tripping of the 220 kV Somanahalli–Harohalli Line resulted in main supply failure to 220 kV Harohalli, KIADB Harohalli, and Kanakapura Substations.
4. SRPC observed that the operation of the Bus Sectionalizer during the disturbance was not in order and requested KPTCL to review the protection settings. KPTCL informed that the Bus Sectionalizer protection settings had been reviewed and revised following the incident. They further informed that during the CEA team site visit of failure of Somanahalli ICT the team has suggested to enable weak infeed logic and they are currently reviewing it.
5. KPTCL stated that, at 20:05 hrs, the loads of Harohalli, KIADB Harohalli, and Kanakapura Substations were restored by transferring the supply to the TK Halli (Mysore source) through charging of the 220 kV Kanakapura–TK Halli Line.
6. KPTCL further informed that, at 20:07 hrs, the 220 kV Harohalli Line was test charged from the Somanahalli end, but the line tripped immediately on Switch-On-To-Fault (SOTF) protection after detecting an R-Y phase fault. Simultaneously, 500 MVA ICT-1 at the Somanahalli PGCIL Substation tripped on Differential Protection and Restricted Earth Fault (REF) Protection.
7. SRPC enquired regarding the nature of the fault. KPTCL stated that post-fault inspection revealed that the R-phase jumper had snapped near the Kaggalipura area, close to 220 kV Somanahalli Substation, which was identified as the cause of the fault. **Remedial action taken:**
 - 220kV Somanahalli-Harohalli line was test charged at 04:50 Hrs on 01.06.2026 after attending the line fault and normalcy of loads were resumed.
 - Settings of Bus Sectionalizer non directional OC / EF protection was reviewed and revised settings have been implemented on 06.06.2026
 - Further, Somanahalli – Halli line has been inspected, thermos vision scanning and rectification of identified hotspots have been attended by Hotline method.

Recommendations:

 ***KPTCL to submit the DR & EL of Harohalli, Kanakapura end***

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	Complete outage of 220kV Sabarigiri PH of KSEB	As per the reports submitted, the triggering incident was failure of the R-phase pole of the Generator Main Circuit Breaker of Unit-5 to open during a normal shutdown of the generating unit leading to operation of the Local Breaker Backup (LBB) protection and further due to an isolator discrepancy associated with Unit-5, both the 220 kV Main Bus and 220 kV Transfer Bus were tripped leading to the Complete outage of 220kV Sabarigiri PH of KSEB.	02-06-2026 06:37	168	0	GD - 1	15-06-2026	08-06-2026	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 failure of the R-phase pole of the Generator Main Circuit Breaker of Unit-5 to open during a normal shutdown of the generating unit leading to operation of the Local Breaker Backup (LBB) protection and further due to an isolator discrepancy associated with Unit-5, both the 220 kV Main Bus and 220 kV Transfer Bus were tripped leading to the Complete outage of 220kV Sabarigiri PH of KSEB.

2. Time and Date of the Event (घटना का समय और दिनांक): 02-06-2026 06:37

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
TamilNadu State Demand (MW)	16800	16812

TamilNadu State Generation (MW)	5429	5467
Kerala State Demand (MW)	3837	3846
Kerala State Generation (MW)	692	612
Grid Frequency (Hz)	50.04	50.04
SR Demand (MW)	52416	52572
SR Generation (MW)	43940	43945

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

Connectivity at 220kV Sabarigiri PH

220kV Main Bus

1. UNIT 5
2. UNIT 6
3. 2SBPT
4. 2SBPL
5. 2SBEM2
6. 2SBEM3
7. 50MVA TRANSFORMER

220kV Transfer Bus

1. Unit 1
2. Unit 3
3. Unit 4
4. 2SBTN
5. 2SBAM

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

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

7. Duration of interruption (रुकावट की अवधि): 1 hours, 8 minutes

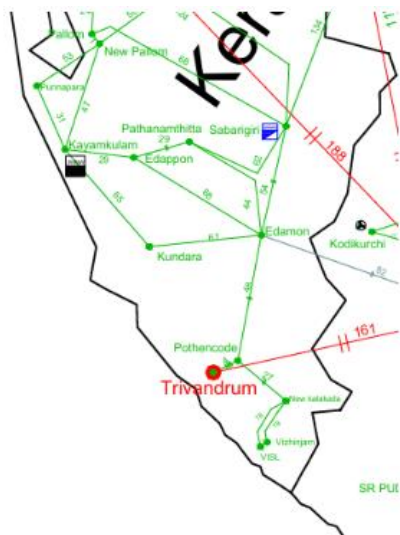
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-EDAMON-SABARIGIRI-3
2. 220KV-EDAMON-SABARIGIRI-1
3. 220KV-EDAMON-SABARIGIRI-2
4. 220KV-SABARIGIRI-PALLOM-1
5. 220KV-THENI-SABARIGIRI-1
6. 220KV-AMBALAMUGAL-SABARIGIRI-1

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

At the time of the incident, Unit-5, Unit-6, 220KV-SABARIGIRI-PATHANAMTHITTA-1, 220KV-SABARIGIRI-PALLOM-1, 220KV-EDAMON-SABARIGIRI-2, 220KV-EDAMON-SABARIGIRI-3 and the 50 MVA Transformer were connected to the 220 kV Main Bus, while Unit-1, Unit-3, Unit-4, 220KV-THENI-SABARIGIRI-1 and 220KV-AMBALAMUGAL-SABARIGIRI-1 were connected to the 220 kV Transfer Bus.



During taking out of Unit-5, where in commands were issued to stop the turbine governor, open the Field Breaker, and open the Generator Main Circuit Breaker (GCB). While the Field Breaker opened successfully and the governor stop command was executed, the R-phase pole of the Generator Main Circuit Breaker failed to open due to a mechanical defect (as per FIR) where in after few seconds Minimum Impedance Protection and Voltage Controlled Overcurrent Protection operated and since the breaker failed to open led to the operation of LBB (As per PMU, around 6 secs of voltage dip was observed). However, due to an existing isolator discrepancy associated with Unit-5, the Busbar Protection scheme identified Unit-5 as being connected to both the 220 kV Main Bus and the 220 kV Transfer Bus and hence both bus sections and tripped all associated bays and DT was sent to remote ends (for lines). This led to the Complete outage of 220kV Sabarigiri PH of

KSEB.

11. DR Analysis:

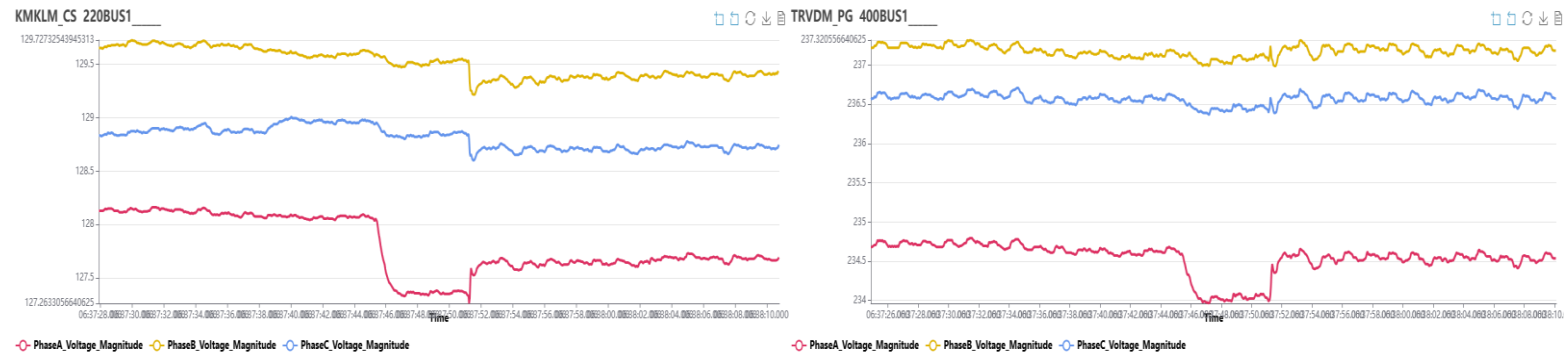
220KV-THENI-SABARIGIRI-1

	THENI - 220KV	SABARIGIRI - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:02-06-2026 06:37:51.245 DT RECIEVE ARR L/O, 3PH INI TO B/B Ir (max): 0.04 kA Iy (max): 0.04 kA Ib (max): 0.05 kA Vr (max): 138.27 kV Vy (max): 159.12 kV Vb (max): 141.85 kV	No DR uploaded

SABARIGIRI - 220KV

	SABARIGIRI - 220KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:07-05-2026 18:22:44.490 [VO.25] I> Alarm Ir (max): 3.04 kA Iy (max): 0.28 kA Ib (max): 0.19 kA DR Trigger Time:02-06-2026 07:01:58.775 [VO.25] I> Alarm [BO.03] TRIP COIL 1, [BO.04] TRIP COIL 2, [VO.26] CBF St1 Trip Ir (max): 0.74 kA Iy (max): 0.00 kA Ib (max): 0.00 kA DR Trigger Time:02-06-2026 07:02:00.305 [VO.15] BB CBF Trip Ir (max): 0.45 kA Iy (max): 0.00 kA Ib (max): 0.00 kA

12. A) PMU Analysis:



From PMU data, R-ph voltage dip can be observed from 06:37:45.360 to 06:37:51.240 Hrs.

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

Constituent	Points for review
KSEB	1. Non opening of R phase pole of generator circuit breaker needs review 2. Non operation of LBB after hand tripping of the Unit-5 needs review 3. Tripping of both the buses due to isolator discrepancy associated with Unit-5 needs review.

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

Constituent	Remedial Actions
	1. Following the busbar protection operation and subsequent outage, restoration activities were carried out at Sabarigiri Power Station. Units-1, Units-3, Units-4, and Units-6 were kept under Restricted Shutdown (RSD). The 220 kV Sabarigiri–Pathanamthitta feeder could not be restored along with the other feeders. The feeder was charged from the Pathanamthitta end at 08:22 Hrs; however, while

	attempting to tie the feeder at the Sabarigiri end, it tripped at 08:25 Hrs on Pole Discrepancy Protection indication.
--	--

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

16. Restoration Details:

Following the busbar protection operation and subsequent outage, restoration activities were carried out at Sabarigiri Power Station.

Units-1, Units-3, Units-4, and Units-6 were kept under Restricted Shutdown (RSD). The transmission feeders were restored in a phased manner as detailed below:

- 220 kV Sabarigiri–Edamon #2 feeder charged at 07:45 Hrs
- 220 kV Sabarigiri–Edamon #3 feeder charged at 07:46 Hrs
- 220 kV Sabarigiri–Ambalamugal feeder charged at 08:15 Hrs
- 220 kV Sabarigiri–Theni feeder charged at 08:16 Hrs
- 220 kV Sabarigiri–Pallom feeder charged at 08:27 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	KSEB

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

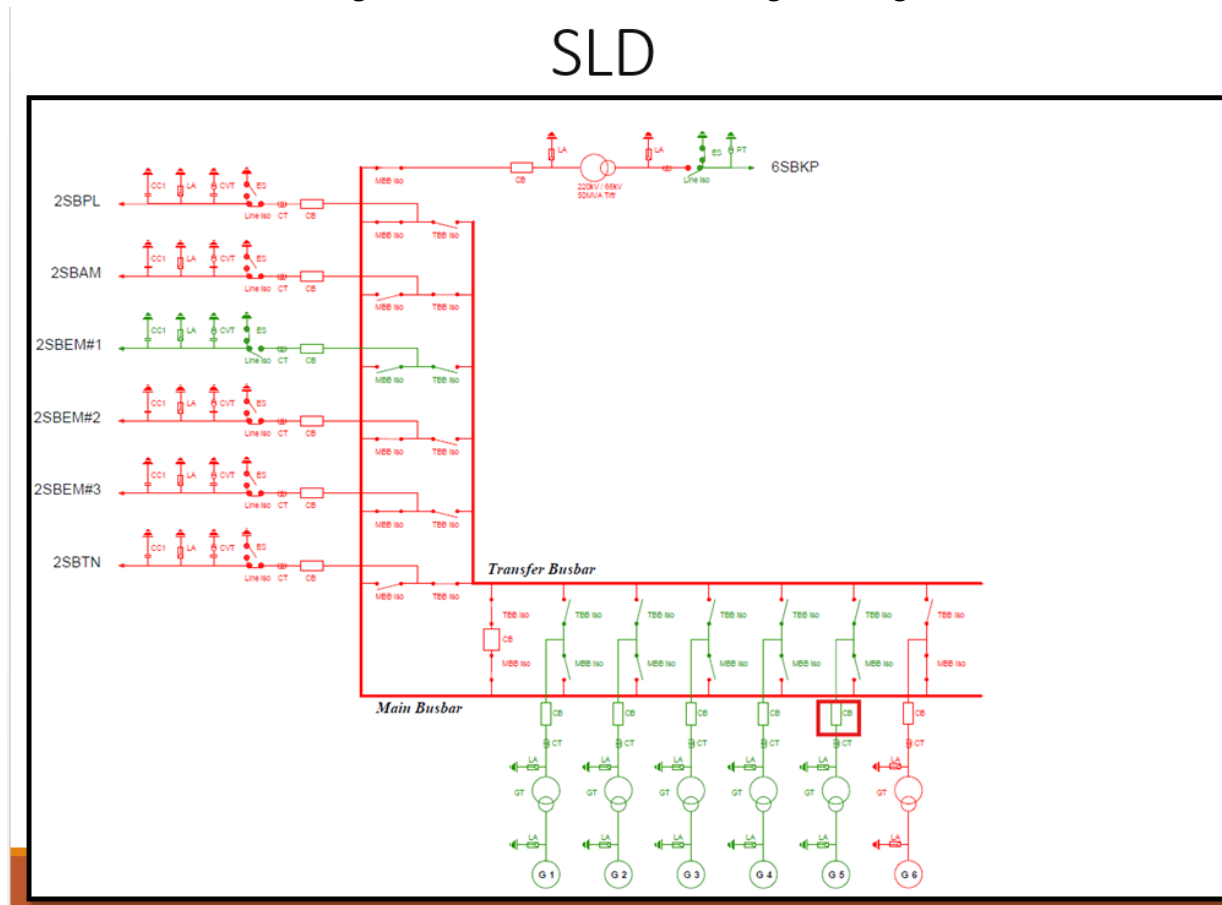
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
02-06-2026 06:37:55	SABARIGIRI CB CB 20452 (GT-3) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB 20852 (LINE TO THNI2) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB 20952 (LINE-1 TO EMON2) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB 21352 (LINE TO PLLM2) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB CB 20652 (GT-1) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB 21152 (LINE-3 TO EMON2) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB CB 20352 (GT-4) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB 21052 (LINE-2 TO EMON2) OPEN	SBGR2_KL
02-06-2026 06:37:57	SABARIGIRI CB CB 20152 (GT-6) CLOSED	SBGR2_KL

Deliberations:

1. KSEBL stated that, under antecedent conditions, Unit-5, Unit-6, 220 kV Sabarigiri–Pathanamthitta Line-1, 220 kV Sabarigiri–Pallom Line-1, 220 kV Edamon–Sabarigiri Line-2, 220 kV Edamon–Sabarigiri Line-3, and the 50 MVA Transformer were connected to the 220 kV Main Bus, while Unit-1, Unit-3, Unit-4, 220 kV Theni–Sabarigiri Line-1, and 220 kV Ambalamugal–Sabarigiri Line-1 were connected to the 220 kV Transfer Bus.



2. KSEBL informed that the triggering incident occurred on 02.06.2026 at 06:37 hrs, when the 220 kV Busbar Protection at Sabarigiri Power Station operated consequent to the operation of the Local Breaker Backup (LBB) Protection associated with Unit-5.
3. KSEBL stated that, while carrying out a normal shutdown of Unit-5, the R-phase pole of the Generator Main Circuit Breaker failed to open due to a mechanical defect. As the stop command had already been issued to the generating unit, the control system simultaneously issued opening commands to the Generator Main Circuit Breaker, Field Breaker, and Governor Stop mechanism.
4. KSEBL informed that the Field Breaker opened successfully and the Governor Stop command was executed. However, the R-phase pole of the Generator

Main Circuit Breaker remained closed. Consequently, power flowed from the grid into the machine, resulting in the operation of Minimum Impedance Protection and Voltage Controlled Overcurrent Protection, which initiated tripping of the generating unit.

5. KSEBL further stated that, along with the generator trip command, fresh opening commands were issued to the Generator Main Circuit Breaker and Field Breaker, and LBB initiation was extended to the Busbar Protection Relay. As the Generator Main Circuit Breaker failed to open even after the second trip command, the LBB Protection operated, resulting in Busbar Protection operation. Since Unit-5 was connected to the Main Bus, and owing to an isolator discrepancy associated with Unit-5, both the Main Bus and the Transfer Bus were tripped by the Busbar Protection scheme.
6. SRPC instructed KSEBL to ensure strict adherence to the approved Standard Operating Procedures (SOPs) during testing and maintenance activities. SRPC further enquired regarding the availability of the Re-trip feature in the LBB scheme. KSEBL stated that the same would be verified and the status would be updated to the forum.
7. SRPC highlighted the Disturbance Recorder (DR) time synchronization issue observed at Sabarigiri Power Station and requested KSEBL to rectify the same at the earliest.

Recommendations:

✚ ***KSEBL to strictly adhere to SOP***

✚ ***KSEBL to rectify DR time sync issue at Sabaragiri SS.***

✚ ***KSEBL to analyse and furnish reasons for Non opening of R phase pole of generator circuit breaker***

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
10	Complete Outage of 765kV NCPS Pooling station of TANTRANSCO and 765kV NCTPS Generating station of TNPGL	765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. During antecedent conditions, 765kV Ariyalur NCPS Line-1 was under outage from 18-05-2026 23:30 Hrs due to Y-G fault and hence 765kV NCPS Pooling station and 765kV NCTPS Generating station were radially connected to 765kV Ariyalur NCPS Line-2. The triggering incident is the Y-G fault in the 765kV Ariyalur NCPS Line-2 and the line tripped. Tripping of the only source led to complete outage of 765kV NCPS Pooling station and 765kV NCTPS Generating station	03-06-2026 18:34	483	0	GD - 1	11-06-2026	05-06-2026 10-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. During antecedent conditions, 765kV Ariyalur NCPS Line-1 was under outage from 18-05-2026 23:30 Hrs due to Y-G fault and hence 765kV NCPS Pooling station and 765kV NCTPS Generating station were radially connected to 765kV Ariyalur NCPS Line-2. The triggering incident is the Y-G fault in the 765kV Ariyalur NCPS Line-2 and the line tripped. Tripping of the only source led to complete outage of 765kV NCPS Pooling station and 765kV NCTPS Generating station

2. Time and Date of the Event (घटना का समय और दिनांक): 03-06-2026 18:34

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)	18138	18082
TamilNadu State Generation (MW)	7504	6879
Grid Frequency (Hz)	50.15	50.1
SR Demand (MW)	52430	52461
SR Generation (MW)	47757	47327

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

Elements under outage	1. 765KV-ARIYALUR-NCPS-1
Weather Condition (मौसम स्थिति)	Normal

At NCTPS ST3 end :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. NCTPS STG3 - 765KV - Bus 1 2. 765KV-NCPS-NCTPS STG3-1 3. 765KV/27KV NCTPS STG3-GT-1	1. NCTPS STG3 - 765KV - Bus 2 2. 765KV-NCPS-NCTPS STG3-2

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

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

7. Duration of interruption (रुकावट की अवधि): 1 hours, 40 minutes

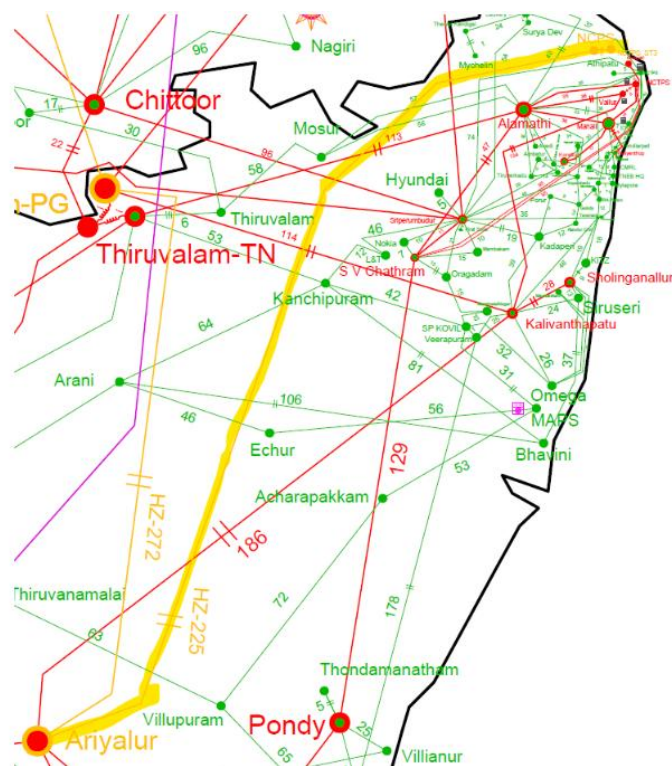
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 765KV/27KV NCTPS STG3-GT-1
2. NCTPS STG3 - UNIT 1
3. 765KV-ARIYALUR-NCPS-2

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

765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. During antecedent conditions, 765kV Ariyalur NCPS Line-1 was under outage from 18-05-2026 23:30 Hrs due to Y-G fault and hence 765kV NCPS Pooling station and 765kV NCTPS Generating station were radially connected to 765kV Ariyalur NCPS Line-2.



As per the reports submitted, the triggering incident was Y-G fault in 765kV Ariyalur NCPS Line-2 during 18:30 Hrs and 18:33 Hrs.

Fault at 18:30:43.368 Hrs :

At Ariyalur end, the fault was sensed in Z2 carrier aided protection, Y-pole opened in both main and tie breakers, Auto recloser only operated in main breaker

and did not operate in tie breaker. The tie breaker R and B poles tripped due to suspected PD operation and 3ph tripped. Main breaker AR was successful and the line was holding. At NCPS end AR operated and was successful (based on DR from Ariyalur end).

Fault at 18:33:55.952 Hrs :

At Ariyalur end, the fault was sensed in Z2 carrier aided protection, AR did not operate and 3ph. At NCPS end, the fault was sensed in Z1, AR operated and tripped due to persistent fault.

Tripping of the only source (765kV Ariyalur NCPS Line-2) led to complete outage of 765kV NCPS Pooling station and 765kV NCTPS Generating station. During the event NCTPS ST3 U1 was in service and was generating around 483 MW and tripped on Low forward power protection (as per FIR) and leading to generation loss of 483MW.

11. DR Analysis:

765KV-ARIYALUR-NCPS-2

	ARIYALUR - 765KV	NCPS - 765KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:03-06-2026 18:30:43.368 10 CARR REC-1 Any Trip, Aided 1 Trip B CB1 AR 1p InProg, AR Start, ARIP, CB2 AR 1p InProg L18 AR INI Y Zone 1 B Trip, R17 CARR SEND-1 L2 MN CB Y OPN, L15 TIE CB Y OPN Auto Close CB1, R14 MCB AR CLS Auto Close CB2, R15 TCB AR CLS CB2 AR Lockout, R8 TIE GR-A TRP, R31 TIE GR-B TRP L21 TIE AR BLK Any Trip L14 TIE CB R OPN	DR Trigger Time:03-06-2026 18:33:55.912 Any Start Any Trip, DIST Trip B, DIST Fwd, Z1 Any Pole Dead DIST. Chan Recv Any Start DIST Fwd Any Trip, Z1, SOTF/TOR Trip External Trip C Any Pole Dead All Pole Dead Ir (max): 0.76 kA Iy (max): 2.82 kA Ib (max): 1.29 kA Vr (max): 511.50 kV Vy (max): 444.51 kV Vb (max): 527.13 kV

	L16 TIE CB B OPN Ir (max): 0.46 kA Iy (max): 1.68 kA Ib (max): 0.47 kA Vr (max): 462.19 kV Vy (max): 487.85 kV Vb (max): 462.89 kV DR Trigger Time:03-06-2026 18:33:55.952 10 CARR REC-1 Any Trip, Aided 1 Trip B L4 86A OPTD, L4 86A OPTD, L18 AR INI Y, L20 MN AR BLK Zone 1 B Trip, CB1 AR 1p InProg, AR Start, ARIP, R17 CARR SEND-1 L2 MN CB Y OPN L1 MN CB R OPN, L3 MN CB B OPN 10 CARR REC-1 Ir (max): 0.55 kA Iy (max): 3.77 kA Ib (max): 1.13 kA Vr (max): 540.29 kV Vy (max): 527.66 kV Vb (max): 536.04 kV	
--	---	--

NCPS - 765KV

	NCPS - 765KV
Time Sync Issue	No
DR Analysis	

NCTPS STG3 - 765KV

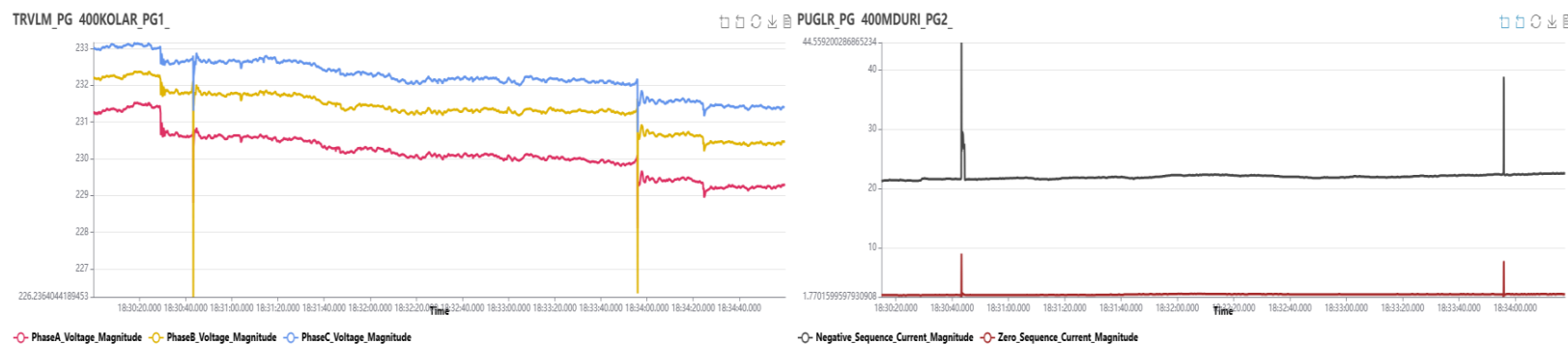
	NCTPS STG3 - 765KV
--	--------------------

Time Sync Issue	No
DR Analysis	DR Trigger Time:03-06-2026 18:34:23.915 F<2 Trip, Any Trip 4 HVCB/GCB OPEN Power2 Trip Ir (max): 5.29 kA Iy (max): 5.31 kA Ib (max): 5.36 kA Vr (max): 16.38 kV Vy (max): 16.55 kV Vb (max): 16.40 kV

765KV/27KV NCTPS STG3-GT-1

	NCTPS STG3 - 765KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:03-06-2026 18:34:23.915 F<2 Trip, Any Trip 4 HVCB/GCB OPEN Power2 Trip Ir (max): 5.29 kA Iy (max): 5.31 kA Ib (max): 5.36 kA Vr (max): 16.38 kV Vy (max): 16.55 kV Vb (max): 16.40 kV

12. A) PMU Analysis:



From the PMU plot, Y-G fault can be observed at 18:30 and 18:33 Hrs without any delayed fault clearance.

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

Constituent	Points for review
TANTRANSCO	1. Non operation of tie breaker AR during the first Y-G fault at 18:30 Hrs needs review 2. Non operation of main breaker AR during the second Y-G fault at 18:33 Hrs needs review

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

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

16. Restoration Details: 03/06/2026 20:14

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)	TANTRANSCO, TNPGL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TNPGL
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

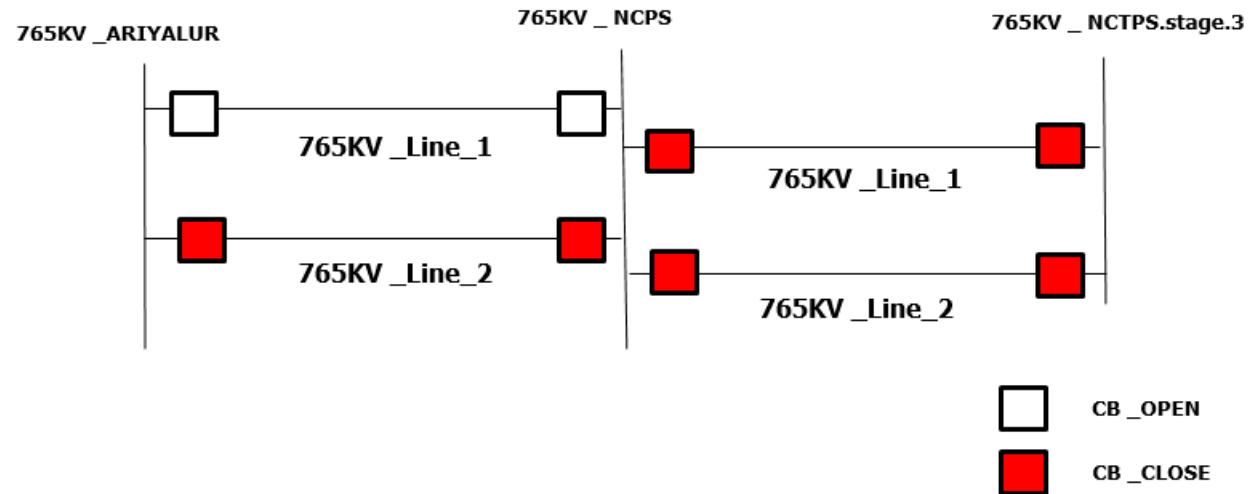
Annexure 1

Sequence of Events as per SCADA

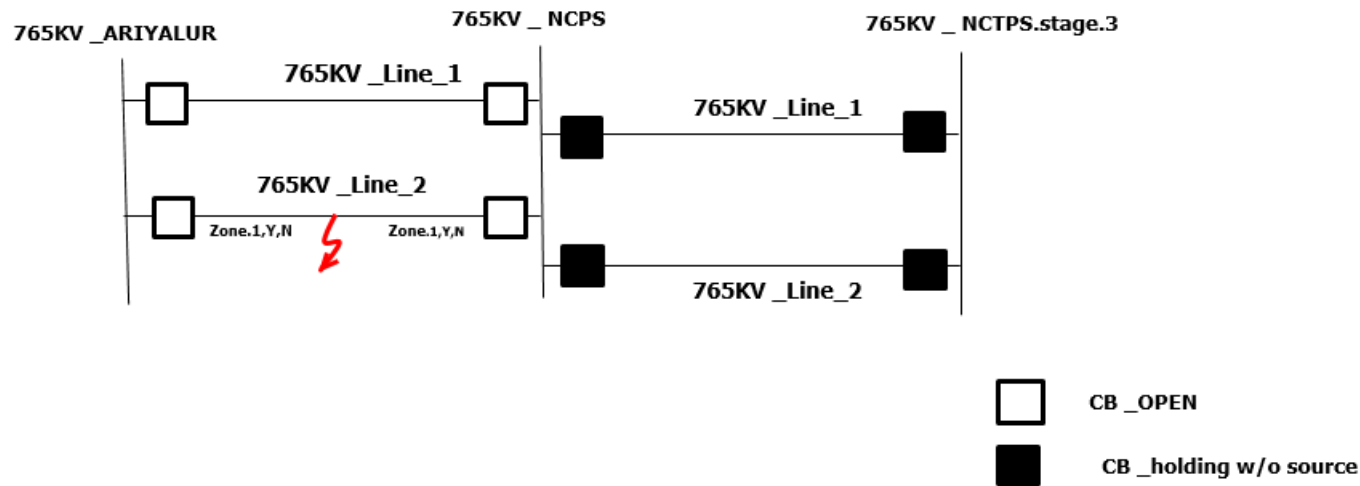
time	Event	Location
03-06-2026 18:34:07	ARIYALUR CB TIE 15 - CB 71552 OPEN	ARYR7_TN
03-06-2026 18:34:07	NORTH CHN 765 CB TIE 09 - CB 70952 OPEN	NCPS7_TN

Deliberations:

1. TANTRANSCO stated that in the **Antecedent Conditions** 765kV Ariyalur -NCPS Line-1 was under outage from 18-05-2026 23:30 Hrs for attending line breakdown issue.



2. TANTRANSCO informed that on 03-06-2026 at 18:34 hrs, For a single line to ground fault in Y phase, Main CB AR successful. Subsequent fault within reclaim time Lockout trip initiated at Ariyalur end



3. During the incident, Tie CB was under Line clear. Main CB only in service. For a single line to ground fault in Y phase main CB TOR operated at NCPS end. Due to tripping of 765kV_NCPS to Ariyalur Line.2, NCTPS stage 3 generation pulled out due to No evacuation. Generation loss was around 483 MW.
4. Restoration: 765kV Ariyalur – NCPS Line.2 test charged on 03.06.2026 at 20:16hrs and stood OK
5. SRLDC highlighted that, prior to the above incident, another tripping had occurred at approximately 18:30 hrs, during which Auto Reclosure of the Tie Circuit Breaker at the Ariyalur end had not operated. SRLDC further observed that the remaining healthy poles appeared to have tripped on Pole Discrepancy (PD) and requested TANTRANSCO to examine the event in detail. TANTRANSCO agreed to review the event and furnish the findings to the forum.

Recommendation:

TANTRANSCO to submit the details of Auto reclosure Healthiness of Tie CB at Ariyalur end.

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
11	Complete Outage of 220kV Renew_Surya_Koppal of Renew	As per the report submitted, while charging 220KV/33KV Renew_Surya_Koppal-ICT-1, 220kV KOPPAL-Renew_Surya_Koppal-1 tripped at Renew_Surya_Koppal end and DT was sent to Koppal end. The line tripped at Koppal end upon receiving DT. Tripping of the only connected line led to complete outage of Renew_Surya_Koppal.	06-06-2026 13:42	18	0	GD - 1	13-06-2026	07-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the report submitted, while charging 220KV/33KV Renew_Surya_Koppal-ICT-1, 220kV KOPPAL-Renew_Surya_Koppal-1 tripped at Renew_Surya_Koppal end and DT was sent to Koppal end. The line tripped at Koppal end upon receiving DT. Tripping of the only connected line led to complete outage of Renew_Surya_Koppal.

2. Time and Date of the Event (घटना का समय और दिनांक: 06-06-2026 13:42)

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)	12563	12540
Karnataka State Generation (MW)	7340	7398
Grid Frequency (Hz)	49.91	49.91

SR Demand (MW)	57508	57604
SR Generation (MW)	57919	58144

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Cloudy

At Renew_Surya_Koppal 220 kV :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV/33KV Renew_Surya_Koppal-ICT-1	1. 220KV/33KV Renew_Surya_Koppal-ICT-2

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

Generation Loss (MW)		Load Loss (MW)
Solar	18.0 MW	0.0 MW
Wind	0.0 MW	
Others	0.0 MW	
Total	18.0 MW	

7. Duration of interruption (रुकावट की अवधि): 0 hours, 43 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-KOPPAL-Renew_Surya_Koppal-1

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

Renew_Surya_Koppal-220 kV is radially connected to Koppal 220 kV through 220KV-KOPPAL-Renew_Surya_Koppal-1.

	Vr (max): 145.04 kV Vy (max): 130.41 kV Vb (max): 131.35 kV	DR Trigger Time:06-06-2026 13:42:52.433 L1 DT REC CH1 R9 GRP-A TRIP, R10 GRP-B TRIP L15 86B OPTD, L15 86B OPTD Ir (max): 0.08 kA Iy (max): 0.33 kA Ib (max): 0.17 kA Vr (max): 147.29 kV Vy (max): 129.69 kV Vb (max): 131.49 kV
--	---	--

Renew_Surya_Koppal - 220KV

	Renew_Surya_Koppal - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:06-06-2026 13:42:52.393 Any Trip, Trip Output A, Trip Output B, 86.1 Trip Relay, 86.2 Trip Relay, 87L1 Optd To PMU, DT Send CH-2, Spare DT Send CH-1 A/R Block CB B-ph Open Ir (max): 0.10 kA Iy (max): 0.36 kA Ib (max): 0.19 kA Vr (max): 145.04 kV Vy (max): 130.41 kV Vb (max): 131.35 kV

12. A) PMU Analysis: Nil

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

Constituent	Points for review
RENEW POWER PVT LTD	Tripping of 220KV-KOPPAL-Renew_Surya_Koppal-1 at Renew_Surya_Koppal end while charging ICT-1 needs review

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

Constituent	Remedial Actions
RENEW POWER PVT LTD	Post-fault patrolling and inspection of the transmission line and associated PSS/protection system have been completed, and no abnormalities were observed. it was happened due to a DT operation while Energizing the ICT-1.

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

16. Restoration Details:

Post-fault patrolling and inspection of the transmission line and associated PSS/protection system have been completed, and no abnormalities were observed. It happened due to a DT operation while Energizing the ICT-1. 220KV-KOPPAL-Renew_Surya_Koppal-1 line charged at 14:25 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
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	INDIGRID
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

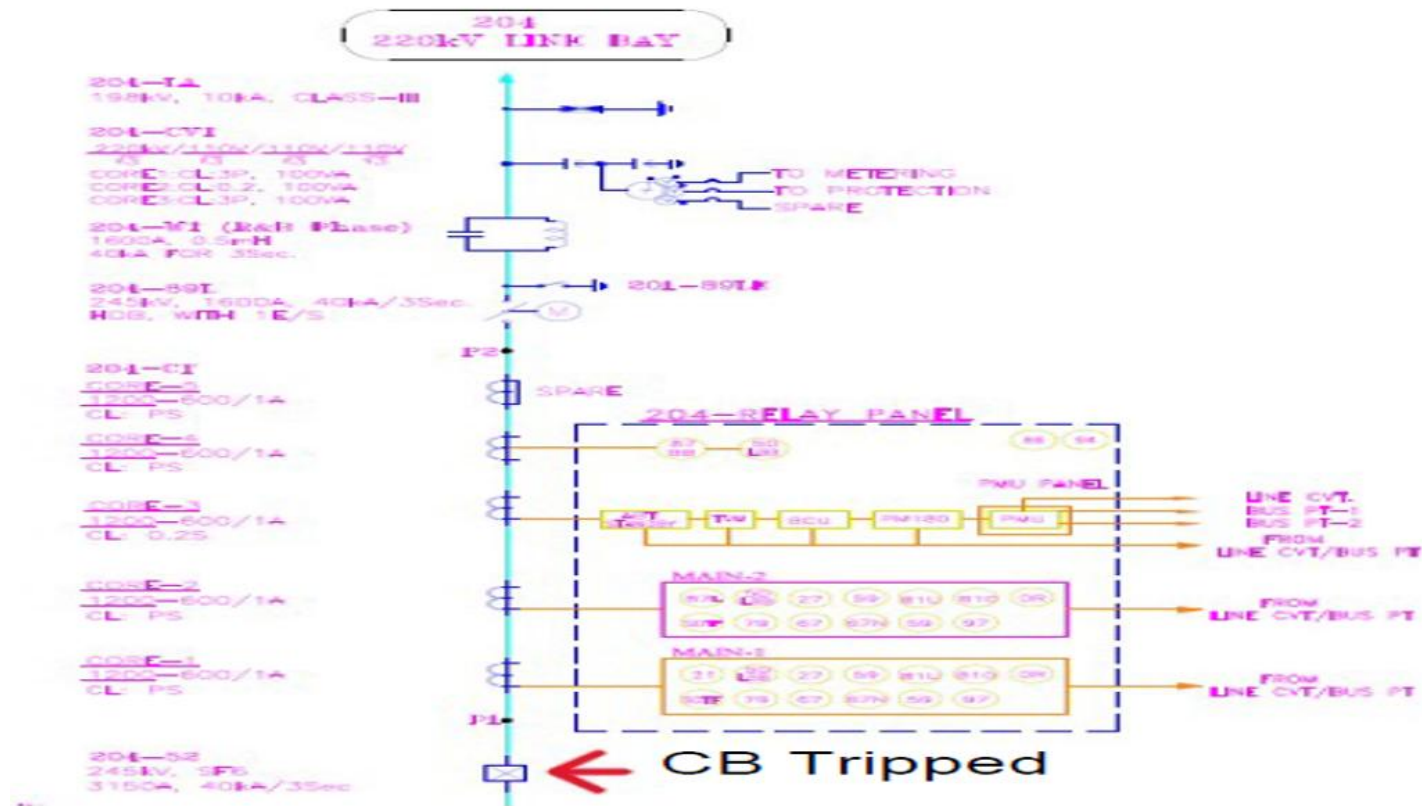
Sequence of Events as per SCADA

time	Event	Location
06-06-2026 13:42:54	KOPPAL CB 20252 (LINE TO RSN12) OPEN	KOPPL_PG

Deliberations:

1. RENEW stated that in the antecedent conditions weather conditions were cloudy and 220KV/33KV Renew_Surya_Koppal-ICT-1 was under outage.
2. RENEW stated that during ICT-1 Energising when 220kV CB charged immediately our 220kV line (bay no:204) got tripped, Operated Master (86 Relay) Trip relay at RSRPL PSS and DT was send to Koppal End.

SLD Bay-204 (RTC1W1 RSRPL)



3. RENEW agreed that tripping is not in order and have forwarded the event to OEM for analysis.

Recommendations:

M/s Renew to refer the event to OEM and furnish detailed report of the event to SRPC& SRLDC.

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
12	Tripping of 220kV Bus-1 & Bus-2 of 400kV Kalaburagi SS of KPTCL and Complete Outage of 220kV Avada Solar plant	220kV Avada Solar is being radially fed from 220kV Kalaburagi Bus-1. As per the reports submitted, the triggering incident was B-G fault in 220kV Kalaburagi Shahpur line. At the same time, B-pole LBB of 220kV Kalaburagi Shahpur line operated at Kalaburagi end tripping all elements connected to 220kV Bus-1 and Bus-2 at 400kV Kalaburagi SS and complete outage of 220kV Avada Solar plant	06-06-2026 15:07	7	0	GD-1	01-07-2026	24-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV Avada Solar is being radially fed from 220kV Kalaburagi Bus-1. As per the reports submitted, the triggering incident was B-G fault in 220kV Kalaburagi Shahpur line. At the same time, B-pole LBB of 220kV Kalaburagi Shahpur line operated at Kalaburagi end tripping all elements connected to 220kV Bus-1 and Bus-2 at 400kV Kalaburagi SS and complete outage of 220kV Avada Solar plant

2. Time and Date of the Event (घटना का समय और दिनांक): 06-06-2026 15:07

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)	12397	12301
Karnataka State Generation (MW)	7450	7472
Grid Frequency (Hz)	50.17	50.14

SR Demand (MW)	59969	59772
SR Generation (MW)	59688	59500

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

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

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

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

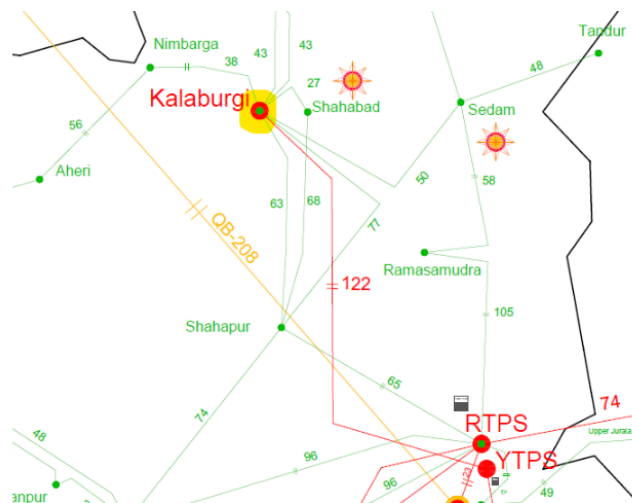
7. Duration of interruption (रुकावट की अवधि): 0 hours, 47 minutes

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 KALABURAGI-ICT-1
2. 400KV/220KV KALABURAGI-ICT-2
3. KALABURAGI - 220KV - Bus 1
4. KALABURAGI - 220KV - Bus 2
5. KALABURAGI - 220KV

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



220kV Avada Solar is being radially fed from 220kV Kalaburagi Bus-1. The triggering incident was B-G fault in 220kV Kalaburagi-Shahpura Line-2. It is reported that, The KPTCL RT team visited the 400 kV Kalaburagi SS on 07.06.2026 to investigate the GD and found that during the fault in 220kV Kalaburagi-Shahpura-2, the Main-2 protection relay (GE/P444) of the line at Kalaburagi end had its distance protection zones blocked due to a VT Fuse Fail condition. However, the non-directional overcurrent element (I> Stage-4), which is configured for blocking auto-reclosure under high fault current conditions, operated as the recorded fault current exceeded its pickup setting. This initiated the internal LBB logic in the Main-2 relay. Since A/R is configured in the Main-1 relay, after sensing the fault in Zone-1 the B-pole opened and other two poles were in closed condition. Since LBB picked up in Main-2 relay and currents in other two poles are more than LBB pickup value, LBB operated after 200ms in Main-2 of 220kV Kalaburagi-Shahpura Line at Kalaburagi end. During LBB operation, all elements connected to 220kV Kalaburagi Bus-1 and Bus-2 tripped because of unintended continuity between Zone-2 and Zone-3 trip circuits in ICT-1 (Bay-206) and ICT-2 (Bay-208). It is reported that the continuity is suspected to have resulted from damaged control cables. This led to tripping of 220kV Bus-1 and Bus-2 of 400kV Kalaburagi SS and complete outage of 220kV Avada Solar.

It is also reported that, at the 400 kV Kalaburagi SS, external LBB functionality configured within the individual bay protection relays is in service, as dedicated busbar LBB protection is not implemented. During the fault, the Main-2 GE/P444 relay operated only through the I> Stage-4 overcurrent element because the distance protection remained blocked due to the VT Fuse Fail condition. Although the I> Stage-4 signal is mapped in the PSL logic to the BAR (Block Auto Reclosure) function, the associated AR lockout and three-phase tripping logic was not initiated since no distance protection element had operated. Consequently, while the faulted B-phase was isolated through single-pole tripping by the Main-1 relay, the persistent current in the healthy phases exceeded the LBB pickup setting, resulting in internal LBB initiation in the Main-2 relay. This ultimately led to operation of the breaker failure protection and issuance of the 96 trip command for Bay-211, causing tripping of both 220 kV Bus-1 and Bus-2.

As an immediate corrective measure, the damaged control cables causing the continuity in Bays 206 and 208 were disconnected and removed. The inadvertent continuity between the Zone-2 and Zone-3 trip buses associated with the 96 protection circuit has been eliminated, and the 96 trip buses for Zones 1, 2, and 3 have been confirmed to be properly isolated.

Further, it is proposed to carry out comprehensive functional testing of the 220 kV Bus-1, Bus-2, and Transfer Bus LBB protection schemes to verify correct

operation and to ensure that no inadvertent tripping command is transferred from one trip bus to another under any fault condition.

11. DR Analysis:

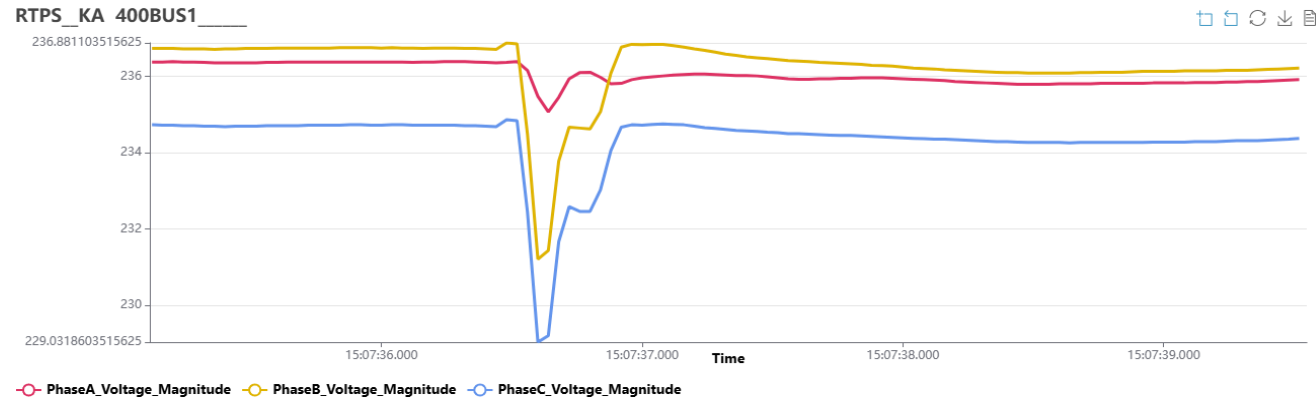
KALABURAGI - 220KV

	KALABURAGI - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:06-06-2026 15:07:36.586 Dis.T.SEND, Dis.Pickup L3, Dis.Pickup E, Dis. forward, Dis. Pickup Z2, Dis. Pickup Z3, Dis.TripZ1/1p, Relay PICKUP, Relay PICKUP L3, Relay PICKUP E, Relay TRIP L3, Relay TRIP AR in progress O/C PICKUP B-PH INI 1pole open L3 >BF Start 3pole, AR BLOCK Definitive TRIP Relay PICKUP, Relay PICKUP L1, Relay PICKUP L2, Relay PICKUP L3 EF Pickup, EF 3I0p Pickup, Relay PICKUP E M2VTFAIL Ir (max): 0.36 kA Iy (max): 0.61 kA Ib (max): 18.62 kA Vr (max): 139.33 kV Vy (max): 143.45 kV Vb (max): 127.97 kV

220KV-SHAHABAD-FEROZABAD-1

	SHAHABAD - 220KV	FEROZABAD - 220KV
Time Sync Issue	No	No
DR Analysis	DR is not available	DR is not available

12. A) PMU Analysis:



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

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

Constituent	Points for review
KPTCL	1. Non availability of Re trip in LBB at Kalaburagi SS. 2. Tripping of elements connected to 220kV Bus-1 & Bus-2 for LBB operation of only Bus-2 connected line. 3. LBB initiation due to I>4 trip at kalaburagi SS.

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

Constituent	Remedial Actions
KPTCL	After this incident the I>4 tripping in Main-2 relay has been assigned to 86 relay. Also the retrip command is assigned to 86A & B with 100ms delay. This will avoid any mal operation of 96 due to internal lbb function of M1, M2 Relay and Suspected control cables causing both bus tripping have been isolated.

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

16. Restoration Details:

Element Name Restoration

220 KV Kalaburagi Bus-1 15:52

220 KV Kalaburagi Bus-2 15:54

400/220 KV Kalaburagi ICT-1 15:52

400/220 KV Kalaburagi ICT-2 15:54

220 KV Kalaburagi- Kapnoor d/c 15:57

220 KV Kalaburagi-Nimburga d/c 15:58

220 KV Kalaburagi-Shahpura-2 16:04

220 KV Kalburagi-Sedam 15:59

as per the instructions from SLDC bangalore 500MVA ICT-1&2 charged at 15:52 & 15:54 stood ok, and Bus coupler charged 15:52 & 15:54 stood ok. along with all 220kv lines charged stood ok except 220kv Shahapur-1 due to fault condition

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	

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
06-06-2026 15:08:24	KALBURGI 400 CB 20352 (LINE-1 TO NMBRG) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 20652 (T1_S) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 21152 (LINE-1 TO SHAPR) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 20152 (LINE TO SHABD) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 20452 (LINE-2 TO NMBRG) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 20252 (LINE-2 TO KPNOR) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 21352 (LINE-1 TO KPNOR) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 20852 (T2_S) OPEN	KLBRG_KA
06-06-2026 15:08:24	KALBURGI 400 CB 21252 (LINE TO SEDAM) OPEN	KLBRG_KA

Deliberations:

1. KPTCL stated that in the prefault scenario At Kalaburgi 400/220kV sub station:
 - Double bus operation was in place with following bus configuration on 220kV side:
 - 220kV Bus I: Kapanoor 1, Nimbarga 1, Shahapur 2, Sedam line. Avaada Solar, ICT1.
 - 220kV Bus II: Kapanoor 2, Nimbarga 2, Shahapur 1, Shahabad line and ICT2;
 - Bus Coupler was in closed condition
2. KPTCL informed that on 06.06.2026 at 15:07 hrs, 220 kV Shahapur Line-1 (Bay-211), connected to 220 kV Bus-II, tripped at 400/220 kV Kalaburagi Substation on B-phase to ground fault detected in Zone-1. A fault current of 17 kA was recorded in the B-phase, and the Main-1 relay indicated the fault location at approximately 0.6 km from the substation. The B-phase pole of the circuit breaker opened successfully; however, Local Breaker Backup (LBB) protection subsequently operated and tripped all the elements connected to both Bus-I and Bus-II. The incident resulted in a generation loss of about 7 MW from the Avaada Solar IPP connected to the 220 kV bus. No downstream load interruption was reported.
3. KPTCL stated that detailed investigation revealed that, during the fault on 220 kV Shahapur Line-1, the B-phase circuit breaker pole opened after Auto Reclosure (A/R) initiation from the Main-1 relay. Analysis of the Main-2 Disturbance Recorder (DR) indicated that the distance protection zones remained blocked due to a VT Fuse Failure condition. Consequently, the I>4 non-directional overcurrent element, configured to block Auto Reclosure during severe faults, operated in the Main-2 relay.
4. KPTCL further explained that, since the distance protection element of Main-2 remained blocked due to the VT Fuse Failure, the I>4 element, which was intended only to block Auto Reclosure, did not issue an A/R lockout three-phase trip. Instead, it inadvertently initiated the internal LBB logic, as the R-phase and Y-phase currents exceeded the LBB pickup setting of 0.2 A secondary. Consequently, after a delay of 200 ms, trip commands were issued to all elements connected to both buses.
5. KPTCL informed that, at Kalaburagi Substation, external LBB implemented through the Main Protection Relays of each bay is presently in service, as the existing Busbar Protection scheme does not incorporate an inbuilt LBB function.
6. With regard to the operation of elements connected to 220 kV Bus-I, KPTCL stated that detailed verification revealed damage to the control cables in the ICT bays, which had created unintended continuity between the two trip buses. The damaged control cables were isolated, and the 96 Trip Bus Zones-1, 2, and 3 were properly segregated. Subsequent testing confirmed that no inadvertent trip command was being transferred from one trip bus to the other. KPTCL further informed that detailed verification would require a bus outage, for which approval had been sought from SLDC. It was also informed that the bus selection diode circuitry in the 220 kV Bus Coupler Bay was rectified on 04.07.2026.

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
13	Complete Outage of 220kV Hiriya_Ostro of RENEW	220kV Hiriya_Ostro is connected radially to Hiriya through 220KV-HIRIYUR_OSTRO-HIRIYUR-1. The triggering incident is the R-G fault in the line and the line tripped. Tripping of the only line connected to Hiriya_Ostro led to the complete outage of Hiriya_Ostro of RENEW	08-06-2026 07:49	85	0	GD - 1	11-06-2026	09-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV Hiriya_Ostro is connected radially to Hiriya through 220KV-HIRIYUR_OSTRO-HIRIYUR-1. The triggering incident is the R-G fault in the line and the line tripped. Tripping of the only line connected to Hiriya_Ostro led to the complete outage of Hiriya_Ostro of RENEW

2. Time and Date of the Event (घटना का समय और दिनांक): 08-06-2026 07:49

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)	11595	11500
Karnataka State Generation (MW)	6509	6301
Grid Frequency (Hz)	50.05	50.06
SR Demand (MW)	50406	50308
SR Generation (MW)	48261	47979

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

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

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

Generation Loss (MW)		Load Loss (MW)
Solar	0.0 MW	0.0 MW
Wind	85.0 MW	
Others	0.0 MW	
Total	85.0 MW	

7. Duration of interruption (रुकावट की अवधि): 12 hours, 40 minutes

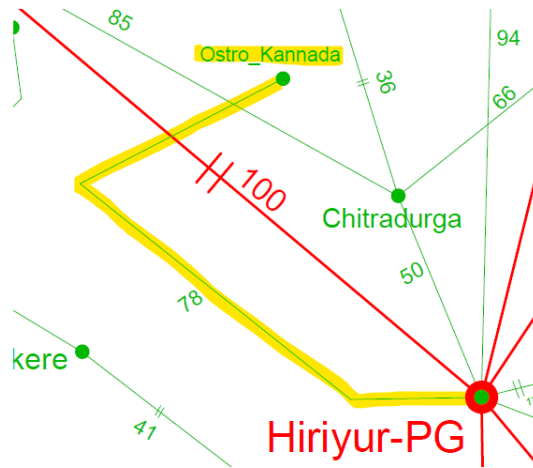
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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):

220kV Hiriyr_Ostro is connected radially to Hiriyrur through 220KV-HIRIYUR_OSTRO-HIRIYUR-1. The triggering incident is the R-G fault in the line during the inclement weather due to suspension insulator failure was observed at Tower No. 67. At Hiriyrur end, the fault was sensed in differential protection, 3ph tripped and further DT was sent to remote end. At Ostro end, the fault was sensed in differential protection and due to receipt of DT 3ph tripped. Tripping of the only line connected to Hiriyrur_Ostro led to the complete outage of Hiriyrur_Ostro of RENEW.



11. DR Analysis:

220KV-HIRIYUR_OSTRO-HIRIYUR-1

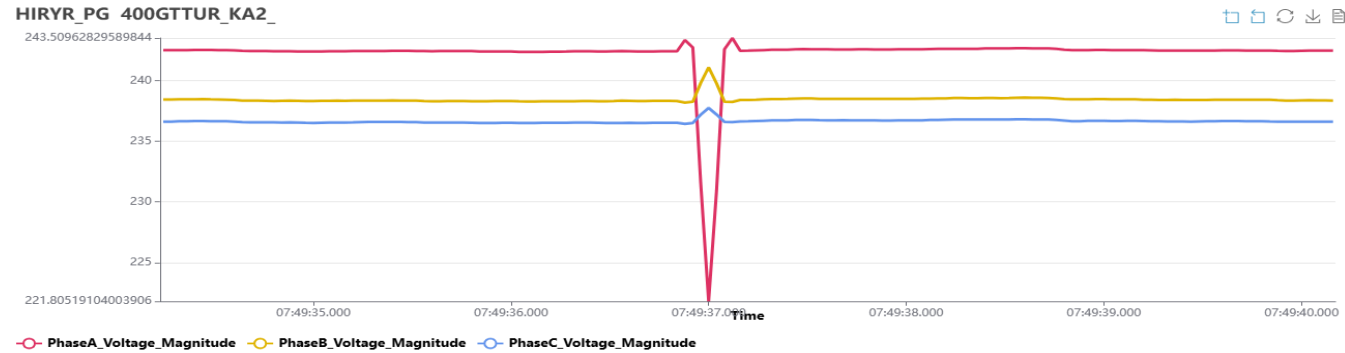
	HIRIYUR_OSTRO - 220KV	HIRIYUR - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:08-06-2026 07:49:36.982 ZMFCPDIS_STFW, ZMFCPDIS_STFW ZMF02-START, ZMF03-START, EF4PTOC[1]-ST L3CPDIF_STL1, L3CPDIF_BLK2H, L3CPDIF_BLK5H, L3CPDIF_BLKHL1 L3CPDIF_STARTRES L3CPDIF_TRIP, L3CPDIF_TRL1, L3CPDIF_STARTUNR	DR Trigger Time:08-06-2026 07:49:37.053 DIR_E/F_START, EF4PTOC_STFW M12CRSD L3CPDIF_STL1, L3CPDIF_BLK2H M2_TRIP L3CPDIF_STARTRES L3CPDIF_TRL1 M1_TRIP, DT_SEND, LDLPSCH_TRL1, R-PH_TRIP, Y- PH_TRIP, B-PH_TRIP

	TRIP1_TRIP, TRIP1 L1, TRIP1 L2, TRIP1 L3, LDLPSCH_TRIP, LDLPSCH_TRL1, BLOCK_AR FAULT_LOOP_R 86A/B OPTD REM_INTR RCV LDLPSCH_TRREM DT RCV CH1 PERM1P TR_BCU_M/ MN CB OPEN R, MN CB OPEN Y, MN CB OPEN B Ir (max): 0.72 kA Iy (max): 0.36 kA Ib (max): 0.35 kA Vr (max): 130.78 kV Vy (max): 141.01 kV Vb (max): 134.90 kV DR Trigger Time:08-06-2026 07:49:36.983 ZMF02-START, ZMF03-START, PHS-STFWL1, PHS-STFWPE TEF-START CARR RCV CH2 CARR RCV CH1 86A/B OPTD DT RCV CH2 TRIP1_TRIP, TRIP1 L1, TRIP1 L2, TRIP1 L3 FAULT LOOP R PERM1P TR_BCU_ ZCOM_TRIP, AR START Ir (max): 0.72 kA Iy (max): 0.36 kA Ib (max): 0.35 kA Vr (max): 130.80 kV Vy (max): 141.02 kV Vb (max): 134.97 kV	FAULT LOOP RPH DT_SEND_CH1 LDCM_DT_RCV PR3P_TRP_MAIN T CB_RO U/V_START T CB_BO T CB_YO M CB_RO M CB_YO M CB_BO M CB_BO Ir (max): 7.45 kA Iy (max): 0.35 kA Ib (max): 0.32 kA Vr (max): 130.82 kV Vy (max): 137.05 kV Vb (max): 131.61 kV
--	---	---

HIRIYUR_OSTRO - 220KV

	HIRIYUR_OSTRO - 220KV
Time Sync Issue	No
DR Analysis	Supply Failure

12. A) PMU Analysis:



From PMU, dip in R-G fault is observed indicating R-G fault during the event with no delayed fault clearance.

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

Constituent	Points for review
PGCIL SR-2	1. Non operation of AR at Hiriyrur end needs review 2. Sending of DT to remote end needs review

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

Constituent	Remedial Actions
OSTRO_KANNADA	1. Line patrolling was conducted, and suspension insulator failure was observed at Tower No. 67. 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.
	2. Line patrolling carried out for entire rest of line and no further observation found.

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

16. Restoration Details:

20:29Hrs on 08/06/2026.

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)	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
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
08-06-2026 07:49:40	HIRIYUR CB TIE 14 - CB 21452 INVALID	HIRYR_PG
08-06-2026 07:49:40	HIRIYUR CB TIE 13 - CB 21352 TRIP	HIRYR_PG
08-06-2026 07:49:40	HIRIYUR CB TIE 13 - CB 21352 INVALID	HIRYR_PG
08-06-2026 07:49:40	OSTRO KANNADA CB 30152 (T1_S) OPEN	OSTRO_CS
08-06-2026 07:49:40	HIRIYUR CB TIE 14 - CB 21452 TRIP	HIRYR_PG
08-06-2026 07:49:40	OSTRO KANNADA CB 20152 (LINE TO HIRYR) NORMAL	OSTRO_CS

Deliberations:

1. It was informed that 220 kV Hiriya-Ostro is radially connected to 220 kV Hiriya Substation through the 220 kV Hiriya-Ostro-Hiriya Line-1, which is the only source feeding the station.
2. Ostro Kannada stated that the triggering incident was an R-phase to ground fault that occurred during inclement weather conditions. Post-fault inspection revealed a failure of the suspension insulator at Tower No. 67. At the Ostro end, the fault was detected by the Line Differential Protection, resulting in three-pole tripping. Since the line was the only source feeding the Hiriya-Ostro pooling station, the tripping resulted in a complete outage of the Hiriya-Ostro station of RENEW.
3. SRPC enquired whether Auto Reclosure (A/R) had been enabled for the transmission line. Ostro Kannada stated that the Auto Reclosure logic has not yet been configured and informed the forum that the same would be implemented during the next available Line Clearance (LC) period. SRPC requested Ostro Kannada to expedite the implementation of Auto Reclosure in accordance with the applicable standards and earlier deliberations of the PCSC. Recommendation

Recommendations:

 **Ostro Kannada to enable Auto reclosure for the lines.**

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
14	Complete Outage of 765kV NCPS Pooling station of TANTRANSCO and 765kV NCTPS Generating station of TNPGL	765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. During antecedent conditions, 765kV Ariyalur NCPS Line-1 was under outage and hence 765kV NCPS Pooling station and 765kV NCTPS Generating station were radially connected to 765kV Ariyalur NCPS Line-2. As per the reports submitted, the triggering incident was persistent Y-G fault in 765kV Ariyalur NCPS Line-2 and the 3-ph tripped. Tripping of the only source led to complete outage of 765kV NCPS Pooling station and 765kV NCTPS Generating station.	09-06-2026 20:10	514	0	GD - 1	11-06-2026	10-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. During antecedent conditions, 765kV Ariyalur NCPS Line-1 was under outage and hence 765kV NCPS Pooling station and 765kV NCTPS Generating station were radially connected to 765kV Ariyalur NCPS Line-2. As per the reports submitted, the triggering incident was persistent Y-G fault in 765kV Ariyalur NCPS Line-2 and the 3-ph tripped. Tripping of the only source led to complete outage of 765kV NCPS Pooling station and 765kV NCTPS Generating station.

2. Time and Date of the Event (घटना का समय और दिनांक: 09-06-2026 20:10)

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)	18701	18709
TamilNadu State Generation (MW)	7727	7706
Grid Frequency (Hz)	50.05	50.04
SR Demand (MW)	53191	53196
SR Generation (MW)	51289	51188

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

Elements under outage	1. 765KV-ARIYALUR-NCPS-1
Weather Condition (मौसम स्थिति)	Normal

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

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

7. Duration of interruption (रुकावट की अवधि): 23 hours, 31 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. 765KV-ARIYALUR-NCPS-2
2. NCTPS STG3 - UNIT 1

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

765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. During antecedent

conditions, 765kV Ariyalur NCPS Line-1 was under outage from 18-05-2026 23:30 Hrs due to R-G fault and hence 765kV NCPS Pooling station and 765kV NCTPS Generating station were radially connected to 765kV Ariyalur NCPS Line-2.

As per the reports submitted, the triggering incident was Y-G fault in 765kV Ariyalur NCPS Line-2. At Ariyalur end, the fault was sensed in Z2 carrier aided trip, AR operated and 3ph tripped due to persistent fault. At NCPS end, the fault was sensed in Z1, AR operated and tripped due to persistent fault. Tripping of the only source (765kV Ariyalur NCPS Line-2) led to complete outage of 765kV NCPS Pooling station and 765kV NCTPS Generating station. During the event NCTPS ST3 U1 was in service and was generating around 514 MW and tripped on low forward power protection (as per FIR) and leading to generation loss of 514 MW.

765KV-ARIYALUR-NCPS-2

	ARIP, L18 AR INI Y, CB2 AR 1p InProg L15 TIE CB Y OPN L2 MN CB Y OPN Auto Close CB1, R14 MCB AR CLS Any Trip, TOR Trip Zone 2, R7 MAIN GR-A TRP, R8 TIE GR-A TRP, R30 MN GR-B TRP, R31 TIE GR-B TRP CB1 AR Lockout, CB2 AR Lockout 10 CARR REC-1 Aided 1 Trip B AR Start L20 MN AR BLK L4 86A OPTD, L4 86A OPTD, L21 TIE AR BLK L18 AR INI Y L1 MN CB R OPN, L3 MN CB B OPN, L14 TIE CB R OPN L16 TIE CB B OPN L2 MN CB Y OPN Ir (max): 0.99 kA Iy (max): 5.06 kA Ib (max): 1.09 kA Vr (max): 804.22 kV Vy (max): 549.65 kV Vb (max): 521.50 kV	
--	---	--

NCTPS STG3 - 765KV

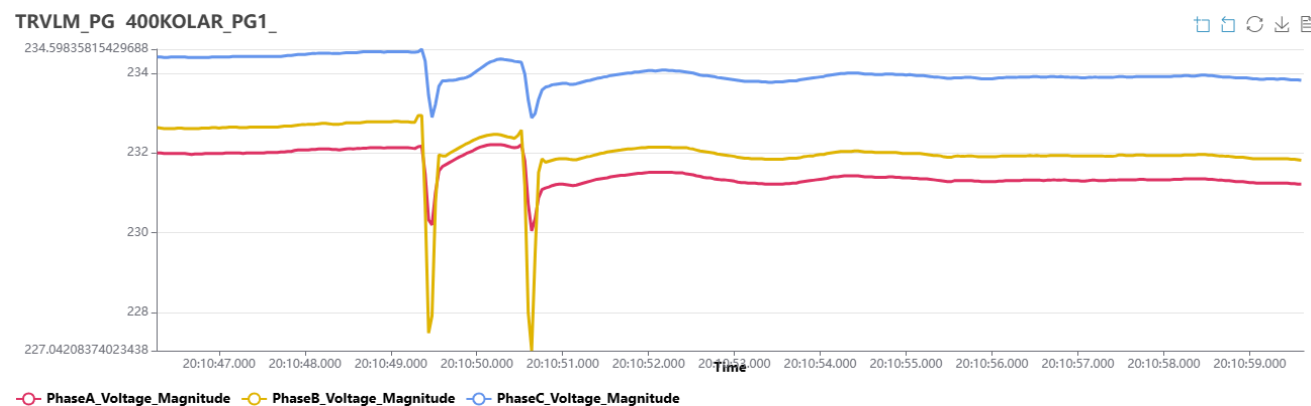
	NCTPS STG3 - 765KV
Time Sync Issue	No

DR Analysis	DR Trigger Time:09-06-2026 20:11:18.806 F<2 Trip, Any Trip V/Hz>4 Trip 4 HVCB/GCB OPEN Power2 Trip Ir (max): 5.38 kA Iy (max): 5.39 kA Ib (max): 5.53 kA Vr (max): 17.48 kV Vy (max): 17.32 kV Vb (max): 17.28 kV
-------------	---

NCPS - 765KV

	NCPS - 765KV
Time Sync Issue	No
DR Analysis	Supply Failure

12. A) PMU Analysis:



From the PMU plot, persistent Y-G fault is observed during the event.

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:

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)	TNPGCL, TANTRANSCO
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

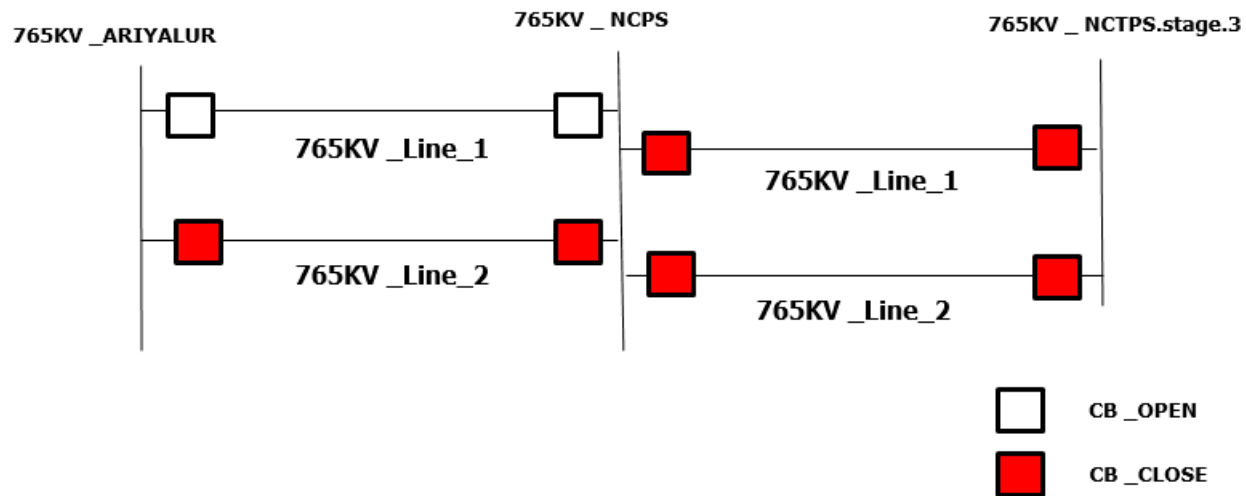
Annexure 1

Sequence of Events as per SCADA

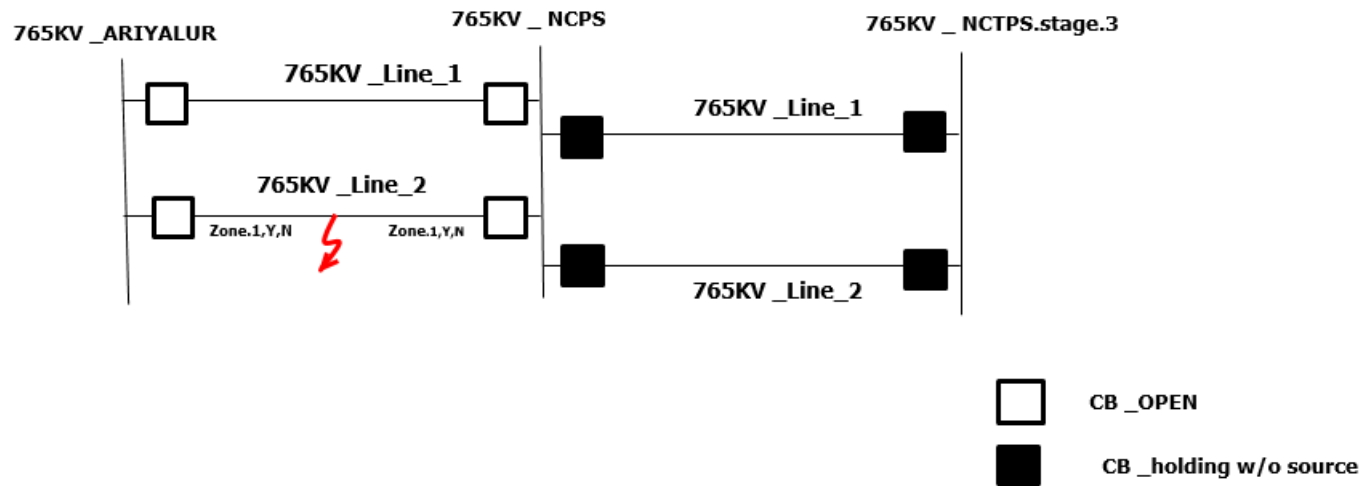
time	Event	Location
09-06-2026 20:10:54	ARIYALUR CB TIE 14 - CB 71452 OPEN	ARYR7_TN
09-06-2026 20:10:54	NORTH CHN 765 CB TIE 09 - CB 70952 OPEN	NCPS7_TN
09-06-2026 20:10:54	ARIYALUR CB TIE 15 - CB 71552 OPEN	ARYR7_TN

Deliberations:

1. TANTRANSCO stated that in the Antecedent Conditions: 765kV Ariyalur - NCPS Line-1 was under outage from 18-05-2026 23:30 Hrs. 765kV Ariyalur – NCPS Line.2 was in service.



2. TANTRANSCO stated that on 09-06-2026 at 20:10 hrs, for a single Line to ground fault in Y phase Main CB, TOR operated and Tie CB lockout trip due to subsequent fault within dead time of Tie CB at Ariyalur end.
3. During the incident, Tie CB was under Line clear. Main CB only in service. For a single line to ground fault in Y phase main CB TOR operated at NCPS end. Due to tripping of 765kV_NCPS to Ariyalur Line.2, NCTPS stage 3 generation pulled out due to No evacuation. Generation loss was around 514 MW.



4. Remedial Action Taken :

- 765kV Ariyalur – NCPS Line.1 charged 10.06.2026 19:42hrs after attending line breakdown at Loc 240
- 765kV Ariyalur – NCPS Line.2 charged on 12.06.2026 at 18:41hrs after attending line breakdown at Loc No.8 & 10 suspension insulator defect.

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
15	Complete Outage of 220kV HSR SS, 220kV Nimhans SS, 220kV Koramangala SS, 220kV Nagnathpura SS of KPTCL	As per the reports submitted, the triggering incident was Y-G fault in 220kV Mylasandra HSR Line-2 and the line tripped. At the same time, 220kV Mylasandra HSR Line-1 and 220kV Mylasandra Nagnathpura lines tripped at HSR end and Nagnathpura end on Zone-1 over reach and SOTF maloperation. This led to over loading of 220kV HSR EPIP line and the line was eventually hand tripped due to arcing. Tripping of all these lines led to complete outage of all radial stations namely 220kV HSR SS, 220kV Nimhans SS, 220kV Koramangala SS, 220kV Nagnathpura SS.	10-06-2026 10:53	0	501	GD - 1	26-06-2026	11-06-2026 19-06-2026	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 Y-G fault in 220kV Mylasandra HSR Line-2 and the line tripped. At the same time, 220kV Mylasandra HSR Line-1 and 220kV Mylasandra Nagnathpura lines tripped at HSR end and Nagnathpura end on Zone-1 over reach and SOTF maloperation. This led to over loading of 220kV HSR EPIP line and the line was eventually hand tripped due to arcing. Tripping of all these lines led to complete outage of all radial stations namely 220kV HSR SS, 220kV Nimhans SS, 220kV Koramangala SS, 220kV Nagnathpura SS.

2. Time and Date of the Event (घटना का समय और दिनांक): 10-06-2026 10:53

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)	12314	11558
Karnataka State Generation (MW)	9315	9310
Grid Frequency (Hz)	50.12	50.19
SR Demand (MW)	56839	56199
SR Generation (MW)	57369	57218

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

Elements under outage	1. 220KV-EDC-NIMHANS-1
Weather Condition (मौसम स्थिति)	Normal

At Koramanagala SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-NIMHANS-KORAMANGALA-1 2. KORAMANGALA - 220KV - Bus 1 3. KORAMANGALA - 220KV	1. 220KV-HSR-KORAMANGALA-1 2. KORAMANGALA - 220KV - Bus 2 3.

Prior to the incident 220kV NIMHANS -EDC line was kept open as per SLDC instructions hence NIMHANS was radial on HSR source.

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	501.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 17 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-NAGNATHPURA-HSR-1
2. 220KV-HSR-MYLASANDRA-2
3. 220KV-MYLASANDRA-HSR-1
4. 220KV-EPIP-HSR-1

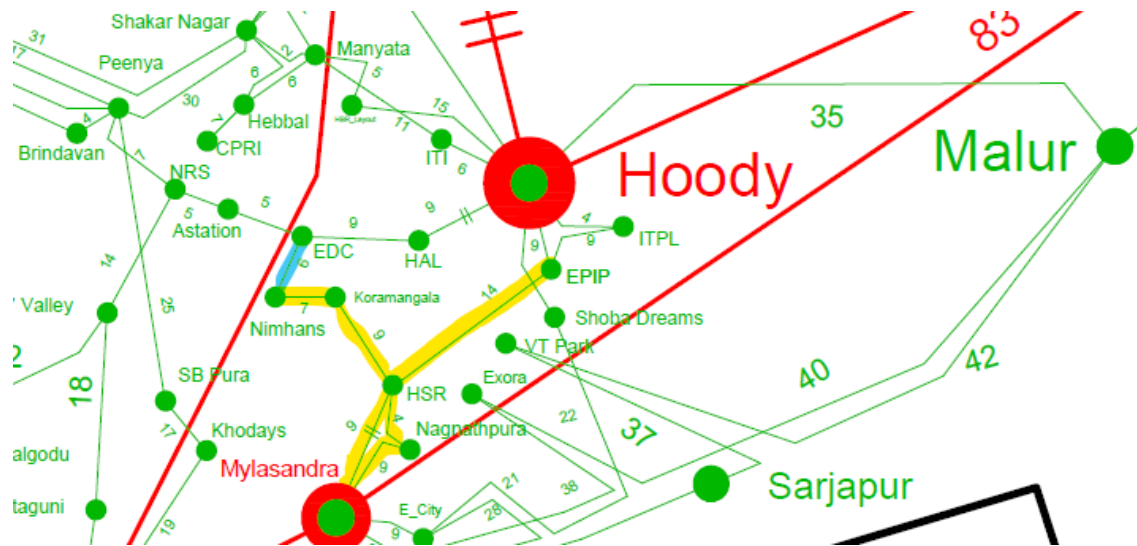
10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

During antecedent conditions, 220kV 220kV NIMHANS -EDC line was kept open as per SLDC instructions. As per the reports submitted, the triggering incident was Y-G fault in 220kV Mylasandra HSR Line-2 due to arcing in Y phase CVT in the line at Mylasandra end. At Mylasandra end, the fault was sensed in zone-1 and the line tripped. At HSR end, the fault was sensed in Zone-2 and carrier was not received. The line tripped with a delay of around 350ms. At the same time, 220kV Mylasandra HSR Line-1 and 220kV Mylasandra Nagnathpura lines tripped at HSR end and Nagnathpura end on Zone-1 over reach and SOTF maloperation in main-2 relay. Further, Due to 86 trip continuous high in 220kV Naganathpura -HSR line at Naganathpura end, when load current in 220kV Nagnathpura HSR line crossed 0.2 A secondary, LBB operated at 220kV Naganathpura SS and all the elements tripped leading to complete outage of 220kV Nagnathpura SS.

After tripping of above lines. the current flow in 220kV HSR EPIP became around 1040 A which subsequently reduced up to 620A after Naganathpura bus tripping and load relief obtained at HSR due to SPS operation(as reported).

Sl. No	Name of the substation	OCR Contact used	Direction of power flow sensed	Stage-1			Stage-2			Stage-3		
				Load Relief Quantum (in MW)	Current setting (Primary Amps)	Time delay in seconds	Load Relief Quantum (in MW)	Current setting (Primary Amps)	Time delay in seconds	Load Relief Quantum (in MW)	Current setting (Primary Amps)	Time delay in seconds
1	HSR	Mylasandra line -2	Reverse*	100	800	0.8	100	800	1.2	-	-	-
		Mylasandra line-1	Reverse	-	-	-	-	-	-	TRIP BUS COUPLER	800	2.0
		EPIP Line	Reverse	100	800	0.8	100	800	1.2	NA	-	NA

Even after the load relief, 220kV HSR EPIP line remained over loaded and the line was eventually hand tripped due to arcing. Tripping of all these lines led to complete outage of all radial stations namely 220kV HSR SS, 220kV Nimhans SS, 220kV Koramangala SS, 220kV Nagnathpura SS.



11. DR Analysis:

NAGNATHPURA - 220KV

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

KORAMANGALA - 220KV

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

NIMHANS - 220KV

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

HSR - 220KV

	HSR - 220KV
Time Sync Issue	No
DR Analysis	Loss of power supply DR of 220kV HSR EPIP line. DR Trigger Time:10-06-2026 10:53:46.397 Any Start I> Start Any B Ir (max): 0.78 kA Iy (max): 0.94 kA Ib (max): 0.72 kA Vr (max): 122.02 kV Vy (max): 123.95 kV Vb (max): 122.99 kV DR Trigger Time:10-06-2026 10:52:42.808 Relay PICKUP BUS_FAULT Relay TRIP >Trig.Wave.Cap., 21 PU Z3, Trip-Y-Ph, Zone1 Trip, Zone1 Star, Zone2 Star, Carrier Snd Y-Ph Initi Trip-R-Ph, Trip-B-Ph 3Ph GR A/B 3Ph LBB In B-Ph Initi R-Ph Initi Ir (max): 0.86 kA Iy (max): 37.00 kA Ib (max): 36.38 kA Vr (max): 123.02 kV Vy (max): 121.48 kV Vb (max): 127.57 kV

220KV-HSR-MYLASANDRA-2

	HSR - 220KV	MYLASANDRA - 220KV
Time Sync Issue	Yes	Yes
DR Analysis	DR Trigger Time:10-06-2026 10:37:06.978 NTRL DIR OC1 FWD GND DIST Z3 PKP, GND DIST Z3 PKP GND DIST Z2 PKP OSC TRIGGER ON (VO40), GND DIST Z1 OP, AR LOCKOUT ON (VO25), DIST YPH TRIP ON (VO16), GND DIST Z1 PKP, NEUTRAL TOC1 PKP R22 M2 Y-PH TRIP CLOSED (CO22), R19 GEN TRIP CLOSED (CO19), R2 M1 Y-PH TRIP RLY CLOSED (CO2), R4 TO 86A RLY CLOSED (CO4), R5 TO 86B RLY CLOSED (CO5), R10 AR LOCKOUT ANN CLOSED (CO10) L8 86B OPTD ON (CI8) L20 86A OPTD ON (CI20) L1 CB R-OPEN ON (CI1), L3 CB B-PH OPEN ON (CI3) L2 CB Y-PH OPEN ON (CI2) Ir (max): 0.68 kA Iy (max): 2.62 kA Ib (max): 0.48 kA Vr (max): 123.29 kV Vy (max): 123.81 kV Vb (max): 123.97 kV	DR of 220kV HSR Mylasandra Line-2 DR Trigger Time:10-06-2026 10:37:06.978 NTRL DIR OC1 FWD GND DIST Z3 PKP, GND DIST Z3 PKP GND DIST Z2 PKP OSC TRIGGER ON (VO40), GND DIST Z1 OP, AR LOCKOUT ON (VO25), DIST YPH TRIP ON (VO16), GND DIST Z1 PKP, NEUTRAL TOC1 PKP R22 M2 Y-PH TRIP CLOSED (CO22), R19 GEN TRIP CLOSED (CO19), R2 M1 Y-PH TRIP RLY CLOSED (CO2), R4 TO 86A RLY CLOSED (CO4), R5 TO 86B RLY CLOSED (CO5), R10 AR LOCKOUT ANN CLOSED (CO10) L8 86B OPTD ON (CI8) L20 86A OPTD ON (CI20) L1 CB R-OPEN ON (CI1), L3 CB B-PH OPEN ON (CI3) L2 CB Y-PH OPEN ON (CI2) Ir (max): 0.68 kA Iy (max): 2.62 kA Ib (max): 0.48 kA

		Vr (max): 123.29 kV Vy (max): 123.81 kV Vb (max): 123.97 kV
--	--	--

220KV-MYLASANDRA-HSR-1

	MYLASANDRA - 220KV	HSR - 220KV
Time Sync Issue	No	Yes
DR Analysis	Line was holding	DR Trigger Time:10-06-2026 10:37:06.978 NTRL DIR OC1 FWD GND DIST Z3 PKP, GND DIST Z3 PKP GND DIST Z2 PKP OSC TRIGGER ON (VO40), GND DIST Z1 OP, AR LOCKOUT ON (VO25), DIST YPH TRIP ON (VO16), GND DIST Z1 PKP, NEUTRAL TOC1 PKP R22 M2 Y-PH TRIP CLOSED (CO22), R19 GEN TRIP CLOSED (CO19), R2 M1 Y-PH TRIP RLY CLOSED (CO2), R4 TO 86A RLY CLOSED (CO4), R5 TO 86B RLY CLOSED (CO5), R10 AR LOCKOUT ANN CLOSED (CO10) L8 86B OPTD ON (CI8) L20 86A OPTD ON (CI20) L1 CB R-OPEN ON (CI1), L3 CB B-PH OPEN ON (CI3) L2 CB Y-PH OPEN ON (CI2) Ir (max): 0.68 kA Iy (max): 2.62 kA Ib (max): 0.48 kA

		Vr (max): 123.29 kV Vy (max): 123.81 kV Vb (max): 123.97 kV
--	--	---

220KV-NAGNATHPURA-MYLASANDRA-2

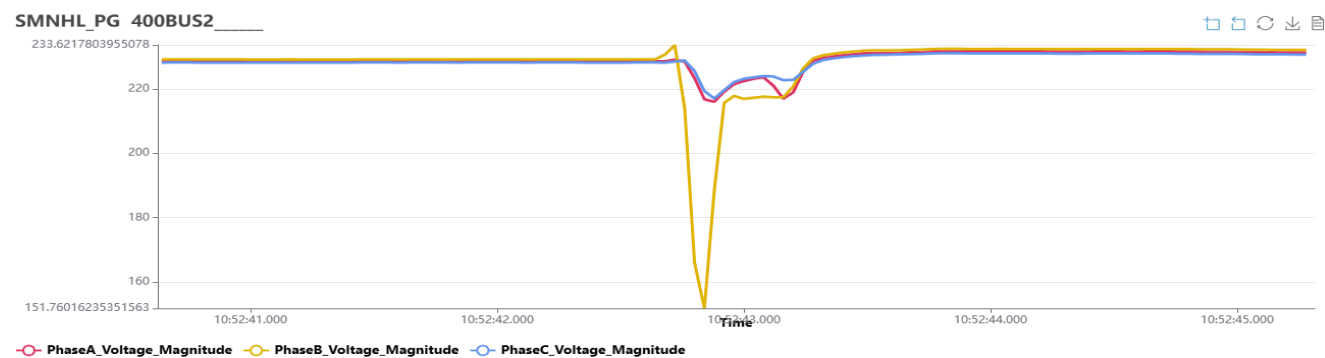
	NAGNATHPURA - 220KV	MYLASANDRA - 220KV
Time Sync Issue	No	No
DR Analysis	DR trigger time:11:51:13.5 SOTF/TOR trip 3P trip	Line was holding

220KV-NAGNATHPURA-HSR-1

	NAGNATHPURA - 220KV	HSR - 220KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:10-06-2026 11:52:42.887 Any Start Z3 Ir (max): 1.62 kA Iy (max): 6.39 kA Ib (max): 0.83 kA Vr (max): 122.72 kV Vy (max): 103.65 kV Vb (max): 122.69 kV DR Trigger Time:10-06-2026 12:41:07.999 13.SOTF INN 1.CB R PH CLOSE 2.CB Y PH CLOSE, 3.CB B PH CLOSE Ir (max): 0.01 kA Iy (max): 0.01 kA Ib (max): 0.02 kA Vr (max): 141.96 kV Vy (max):	Line was holding

	108.02 kV Vb (max): 128.64 kV DR Trigger Time:10-06-2026 10:54:14.169 Start 3-Ph Bay3 Protec Startup CBF Retrip, BZ1 CBF Op DR Trigger Time:10-06-2026 11:51:13.556 Any Start Z2, Relay 4, Relay 5, SOTF/TOR Trip, Any Trip Z3 1.CB R PH CLOSE, 2.CB Y PH CLOSE, 3.CB B PH CLOSE, 8.86 A/B OPTD Ir (max): 2.19 kA Iy (max): 6.30 kA Ib (max): 1.07 kA Vr (max): 124.35 kV Vy (max): 124.18 kV Vb (max): 123.35 kV	
--	---	--

12. A) PMU Analysis:



From the PMU, Y-G fault is observed during the event with a delay of around 350ms.

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

Constituent	Points for review
KPTCL	1. Non operation of A/R in 220kV HSR Mylasandra Line-2. 2. Non-reciept of carrier signal in 220kV HSR Mylasandra Line-2 at HSR end. 3. Maloperation of LBB relay at Nagnathpura SS. 4. Zone-1 over reach in 220kV HSR Mylasandra Line-1 at HSR end.

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

Constituent	Remedial Actions
KPTCL	Settings of Mylasandra line-1 at HSR end is under review PLCC issue at HSR end will be rectified by TCD wing At Naganathpura detail testing of Mylasandra line Main-2 relay, BBP relay etc is scheduled on 20.06.2026 Operation wing have been informed to rectify GPS time synch issue at HSR and Naganathpura Substations.

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

Restoration: Supply restored to Nimhans,Koramangala at 11.10 Hrs by closing EDC-NIMHANS line

Supply restored to Naganathpura and HSR through Hoody source at 11.22 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)	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	

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
10-06-2026 10:53:06	NAGANATHAPURA CB 20452 (T2_P) OPEN	NGNTH_KA
10-06-2026 10:53:06	NAGANATHAPURA CB 20152 (LINE TO MYLS4) OPEN	NGNTH_KA
10-06-2026 10:53:06	NAGANATHAPURA CB 20252 (T1_P) OPEN	NGNTH_KA
10-06-2026 10:53:06	HSR LAYOUT CB 20252 (LINE-1 TO MYLS4) OPEN	HSR__KA
10-06-2026 10:53:06	HSR LAYOUT CB 20652 (LINE TO EPIP_) BETWEEN	HSR__KA
10-06-2026 10:53:06	NAGANATHAPURA CB 20352 (LINE TO HSR_) OPEN	NGNTH_KA

Deliberations:

1. KPTCL stated that in the antecedent conditions Prior to the incident 220kV NIMHANS -EDC line was kept open as per SLDC instructions hence NIMHANS substation was radial on HSR source. 220kV side bus configuration at HSR Substation was as follows :
 - **Bus- 1:** 220kV Mylasandra Line-1, 220kV EPIP, 220/66kV 150MVA TRFO -1 & 3
 - **Bus-2:** 220kV Mylasandra Line-2, 220kV Naganathapura Line, 220kV BMRCL Line, 220kV Koramanagala Line, 220/66kV 100MVA Trfo-2.
 - Bus Coupler was in closed condition.
2. KPTCL informed that at 10.52.42.808 Hrs 220kV Mylasandra-HSR line-2 tripped at both the ends sensing YN fault . At Mylasandra end the line tripped in Zone-1, fault current of 37.4kA is recorded in Y phase. CB tripped within 90 msec.
3. At HSR end, Mylasandra line -2 relays sensed Y-N fault in Zone-2. Due to non receipt of carrier signal , the line CB tripped after Zone-2 time delay. Slow developing fault and fault current of 12.18kA up to 350 msec is observed from the line DR of HSR end.
4. **Nature of fault:** At Mylasandra end in HSR line-2 bay, arcing observed near Y phase CVT, shift operators in the Control Room heard a loud sound also. For the above fault, Mylasandra line-1 tripped at HSR end sensing YN fault in Zone-1(overreach of the GE make, D60 type Main-1 relay was suspected).
5. For the above fault, at Naganathapura also, M1 and M2 relays of Mylasandra line picked up sensing YN fault in Zone-2. Fault current of 6.29kA was observed from the line DR. However due to M2 relay mal operation, the line tripped instantly on SOTF.After tripping of Mylasandra-Naganathapura and Mylasandra - HSR lines, loads of HSR, Koramanagala, NIMHANS and Naganathapura was met through Hoody source through EPIP -HSR line.
6. KPTCL informd that 86 operated' status was continuously high in Naganathapura -HSR line at Naganathapura end. LBB operated when the load current in HSR line (after tripping of Mylasandra line) crossed 0.2 A secondary and all the elements tripped at Naganathapura SS .
7. After tripping of above lines (Mylasandra-HSR 2 at both ends, Mylasandra-HSR-1 at HSR end, HSR-Naganathapura at Naganathapura end) i.e after around 450msec from initiation of the fault, entire load of HSR, Nagamnathapura, Koramangala and Nimhans was met through Hoody source through HSR-EPIP line which subsequently reduced up to 620A after Naganathapura bus tripping and load relief obtained at HSR due to SPS operation is observed from the HSR-EPIP line DR.
8. However due to sustained arcing in HSR-EPIP line bay at HSR end, the line was hand tripped resulting in main supply failure to HSR, Naganathapura, Kormanagala and NIMHANS substations.
9. **Remedial Measures taken Details:**
 - Carrier fail in HSR-Mylasandra line-2 was attended.
 - Over reaching of Main-1 (GE make ,D60) relay of Mylasandra line-1 at HSR end has been referred to OEM , reply awaited.
 - At Naganathapura end , Myasandra line Main-2 relay autoSOTF logic has been reviewed and relay has been tested on 03.07.2026

- After tripping of Naganathpura-Mylasandra line, Naganathapura drawl from HSR was increased. Due to 86 output continues high LBB operated when load current crossed more than LBB pick up value (0.2A). To avoid such incidents, the substation has been informed to be vigilant and follow SOP during day to day operations.
 - The faulty GPS equipment of HSR is sent to OEM for repairs. At Naganathpura, the faulty GPS is to be replaced, the matter is referred to the concerned Operation Division for rectification.
10. SRPC enquired about the availability of LDP for Mylasandra –HSR lines. KPTCL stated that LDP is not available and they have taken up with management for LDP.
 11. SRPC enquired about the retrip feature for LBB . KPTCL stated that they will check and update in this regard. SRPC highlighted about DR time sync issues at HSR and Naganthpura SS and requested KPTCL to rectify the same at earliest.
 12. Regarding AR KPTCL stated that Auto reclosure not enabled due to city lines.

Recommendations:

 ***KPTCL to rectify the DR time sync issue at 220kV HSR & Naganathpura SS***

 ***KPTCL to enable Retrip function for LBB operation.***

 ***KPTCL to install LDP for Mylasandra –HSR lines***

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
16	Complete outage of 220kV Zenataris_PSS	As per the reports submitted, the triggering incident was B-G fault in 220KV-HIRIYUR-ZENATARIS_PSS-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Zenataris_PSS.	12-06-2026 12:25	60	0	GD - 1	30-06-2026	-	Not 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 B-G fault on the 220KV-HIRIYUR-ZENATARIS_PSS-1 line. At both ends the fault was detected in Z1 and B pole was tripped. AR operated but due to persistent fault, the line was 3-phase tripped (TOR). Tripping of the only outgoing transmission line led to the loss of power evacuation path and led to the complete outage of ZENATARIS_PSS - 220KV.

2. Time and Date of the Event (घटना का समय और दिनांक): 12-06-2026 12:25

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)	13549	13686
Karnataka State Generation (MW)	9708	9881
Grid Frequency (Hz)	50.0	49.99
SR Demand (MW)	59898	60175
SR Generation (MW)	55493	55762

**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)
Solar	60.0 MW	0.0 MW
Wind	0.0 MW	
Others	0.0 MW	
Total	60.0 MW	

7. Duration of interruption (रुकावट की अवधि): 5 hours, 19 minutes

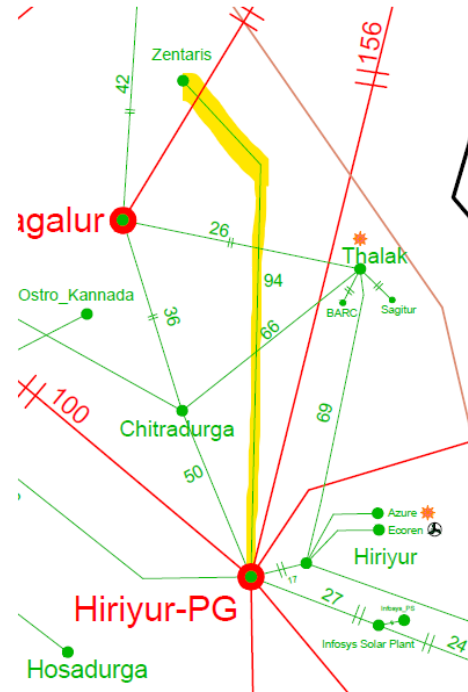
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. ZENATARIS_PSS - 220KV
2. 220KV-HIRIYUR-ZENATARIS_PSS-1

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

ZENATARIS_PSS - 220KV is radially connected to 220kV - HIRIYUR substation through 220KV-HIRIYUR-ZENATARIS_PSS-1.



As per the reports submitted, the triggering incident is B-G fault on the 220KV-HIRIYUR-ZENATARIS_PSS-1 line. At both ends the fault was detected in Z1 and B pole was tripped. AR operated but due to persistent fault, the line was 3-phase tripped (TOR). Tripping of the only outgoing transmission line led to the loss of power evacuation path and led to the complete outage of ZENATARIS_PSS - 220KV and a generation loss of 60MW.

11. DR Analysis:

ZENATARIS_PSS - 220KV

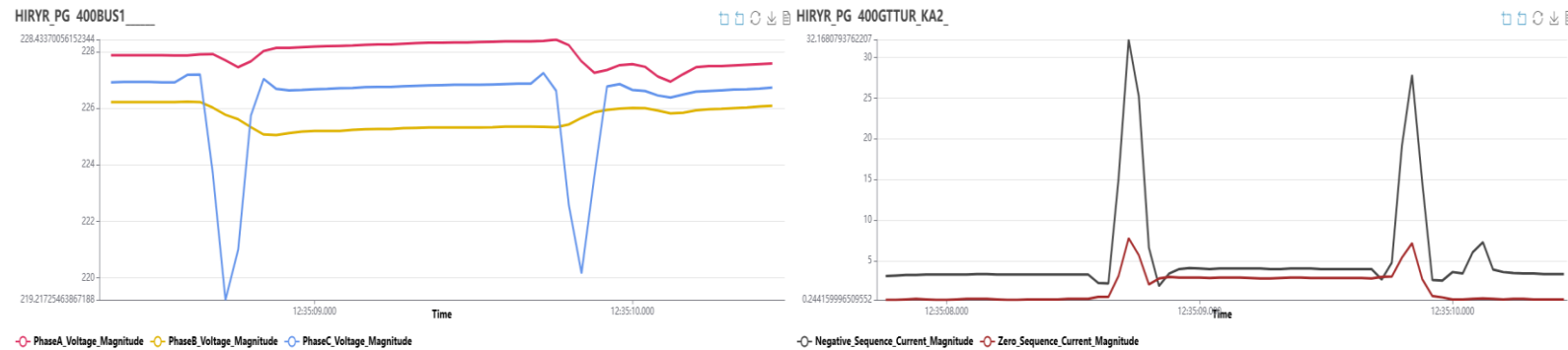
	ZENATARIS_PSS - 220KV
Time Sync Issue	No
DR Analysis	DR not available.

220KV-HIRIYUR-ZENATARIS_PSS-1

	HIRIYUR - 220KV	ZENATARIS_PSS - 220KV
--	-----------------	-----------------------

Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:12-06-2026 13:35:08.278 STARTAR M2_TRIP, M2Z1_OP, M2Z2_ST, M2Z3_ST M1_TRIP M2_CR_RC CAR_TRP M CB_BO T CB_BO PR3P_TR SOTF_INIT M2Z2_ST, M2Z3_ST STARTAR M2_TRIP, M2Z1_OP M CB_BO M1_TRIP M CB_RO, M2_CR_RC M CB_YO T CB_RO T CB_YO Ir (max): 0.53 kA Iy (max): 0.39 kA Ib (max): 2.57 kA Vr (max): 165.42 kV Vy (max): 142.66 kV Vb (max): 123.53 kV	DR Trigger Time:12-06-2026 12:35:08.707 BPH ZONE PICKUP ZONE 3 PICKUP DEF PICKUP, LVRT 0.9PU, UV TRIP 0.9PU ZONE 2 PICKUP CARRIER RECIVED ZONE 1 PICKUP, ZONE 1 TRIP, AR START, CARRIER SEND CARR AIDED TRIP MAIN CB B OPEN AR PREP 3PH AR CLOSE COMMAND SOTF INITIATION DEF PICKUP BPH ZONE PICKUP ZONE 3 PICKUP ZONE 2 PICKUP, SOTF OPERATED, RELAY 3PH TRIP ZONE 1 PICKUP, ZONE 1 TRIP, AR START, CARRIER SEND 86 RELAY OPTD MAIN CB R OPEN, MAIN CB B OPEN CARR AIDED TRIP MAIN CB Y OPEN CB OPEN Ir (max): 0.54 kA Iy (max): 0.39 kA Ib (max): 0.58 kA Vr (max): 164.63 kV Vy (max): 146.08 kV Vb (max): 125.04 kV

12. A) PMU Analysis:



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

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

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

Constituent	Remedial Actions
HIRIYUR_ZREPL	Inspection done 3Km on either side of fault distance and didnt found any abnormalities.

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

16. Restoration Details:

Inspection done 3Km on either side of fault distance and didnt found any abnormalities. Line charged on 12/06/2026 at 17:44.

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)	HIRIYUR_ZRE PL

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

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
12-06-2026 12:35:12	HIRIYUR CB TIE 17 - CB 21752 OPEN	HIRYR_PG
12-06-2026 12:35:12	HIRIYUR CB TIE 16 - CB 21652 OPEN	HIRYR_PG

Deliberations:

There was no representation by Zentarius during the Agenda item Discussion

Recommendations;

-  ***M/s Zentarius to furnsih detailed report for the Grid occurance***
-  ***M/s Zentarius to rectify the DR time sync issue***

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
17	Complete outage of 220kV Zenataris_PSS	As per the reports submitted, the triggering incident was B-G fault in 220KV-HIRIYUR-ZENATARIS_PSS-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Zenataris_PSS.	13-06-2026 10:52	50	0	GD - 1	18-06-2026	-	Not 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 B-G fault in 220KV-HIRIYUR-ZENATARIS_PSS-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Zenataris_PSS

2. Time and Date of the Event (घटना का समय और दिनांक): 13-06-2026 10:52

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)	13362	13275
Karnataka State Generation (MW)	9271	9292
Grid Frequency (Hz)	49.95	49.98
SR Demand (MW)	52376	52408
SR Generation (MW)	52245	52524

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

Elements under outage	1. 220KV-HIRIYUR-ZENATARIS_PSS-1
Weather Condition (मौसम स्थिति)	Normal

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

Generation Loss (MW)		Load Loss (MW)
Solar	49.7 MW	0.0 MW
Wind	0.0 MW	
Others	0.0 MW	
Total	49.7 MW	

7. Duration of interruption (रुकावट की अवधि): 14 hours, 4 minutes

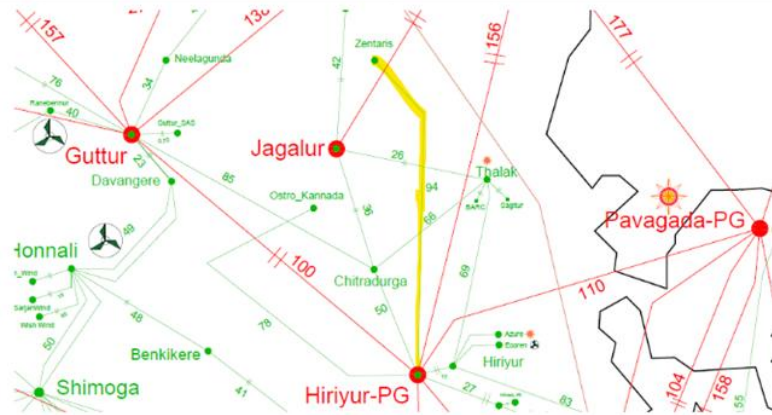
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-HIRIYUR-ZENATARIS_PSS-1

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

220kV Zenataris_PSS is being radially connected through 220KV-HIRIYUR-ZENATARIS_PSS-1. As per the reports submitted, the triggering incident was B-G fault in 220KV-HIRIYUR-ZENATARIS_PSS-1 . At both ends, the fault was sensed in zone-1. A/R operated and the line tripped on persistant fault. Tripping of the only connected line led to complete outage of 220kV Zenataris_PSS.



11. DR Analysis:

ZENATARIS_PSS - 220KV

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

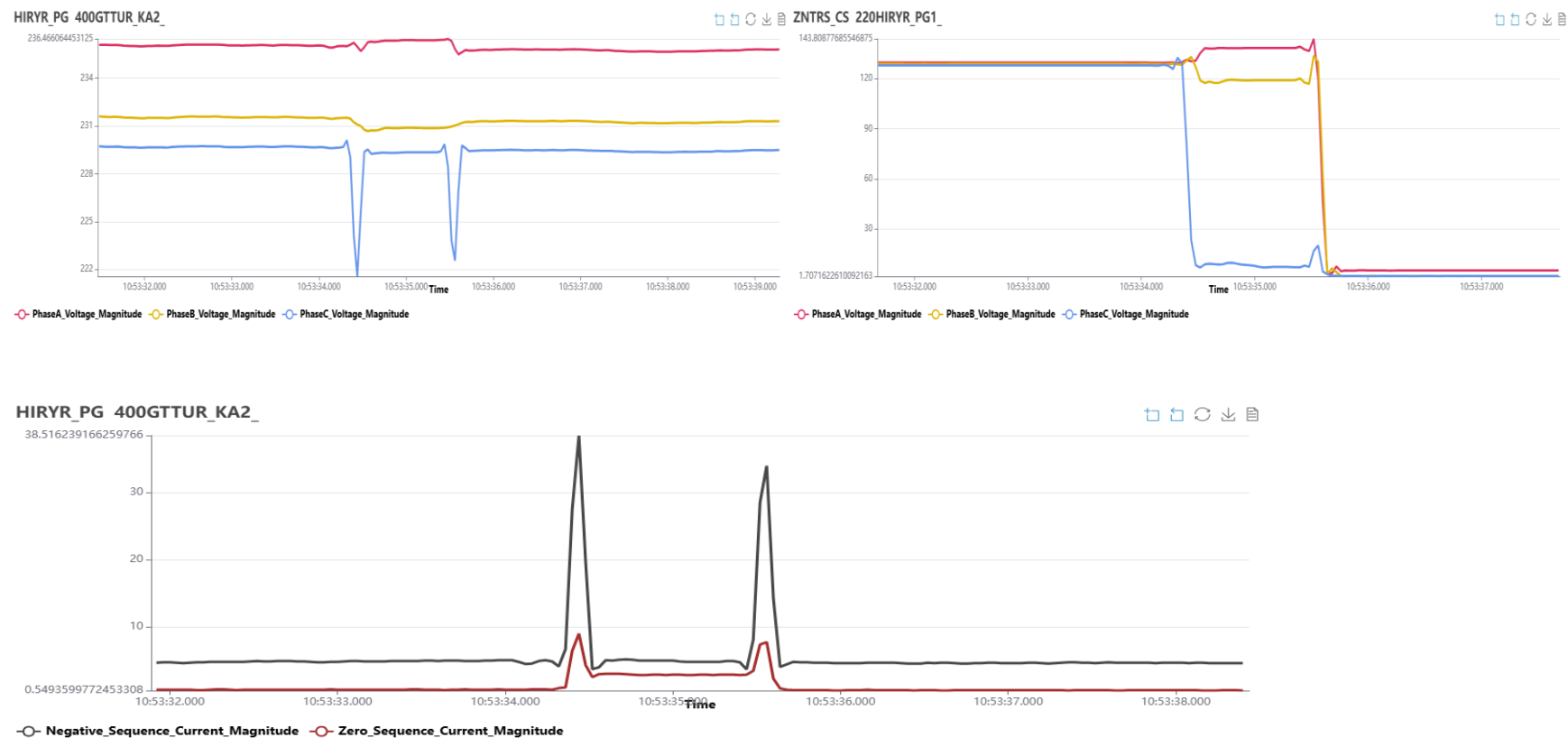
220KV-HIRIYUR-ZENATARIS_PSS-1

	HIRIYUR - 220KV	ZENATARIS_PSS - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:13-06-2026 10:53:34.413 MAIN_Z2_START, MAIN_Z3_START M1/2_CARR_SEND MAIN_Z1_OPTD, START_AR	DR Trigger Time:13-06-2026 10:53:34.405 LVRT 0.9PU, UV TRIP 0.9PU BPH ZONE PICKUP ZONE 2 PICKUP, ZONE 3 PICKUP, DEF PICKUP

MAIN1_TRIP, FAULT_LOOP_B MAIN2_TRIP CARR_CH1 MAIN1/2_CARR_REC MAIN_CB_B_OPEN CARR_CH2 TIE_CB_B_OPEN PREP_3PH_TR_M/T SOTF_INITIATION MAIN_Z3_START MAIN2_TRIP MAIN_Z1_OPTD, MAIN_Z2_START, MAIN_Z3_START, BLOCK_AR, START_AR MAIN1_TRIP, MAIN CB AR LO, TIE_CB_LO, M1/2_SOTF_OPTD, FAULT_LOOP_B CARR_CH1 MAIN1/2_CARR_REC MAIN_CB_B_OPEN 3PH_GR_A/B_OPTD MAIN_CB_R_OPEN MAIN_CB_Y_OPEN TIE_CB_R_OPEN TIE_CB_Y_OPEN Ir (max): 0.53 kA Iy (max): 0.39 kA Ib (max): 2.80 kA Vr (max): 160.41 kV Vy (max): 131.28 kV Vb (max): 125.81 kV DR Trigger Time:13-06-2026 11:53:34.421 STARTAR 65501 M2_TRIP 65493, M2Z1_OP 65492,	CARRIER RECIVED ZONE 1 PICKUP, ZONE 1 TRIP, AR START, CARRIER SEND CARR AIDED TRIP MAIN CB B OPEN AR PREP 3PH AR CLOSE COMMAND SOTF INITIATION DEF PICKUP BPH ZONE PICKUP ZONE 3 PICKUP ZONE 2 PICKUP, SOTF OPERATED, RELAY 3PH TRIP ZONE 1 PICKUP, ZONE 1 TRIP, AR START, CARRIER SEND 86 RELAY OPTD CARR AIDED TRIP, MAIN CB B OPEN MAIN CB R OPEN MAIN CB Y OPEN CB OPEN Ir (max): 0.54 kA Iy (max): 0.39 kA Ib (max): 0.60 kA Vr (max): 160.91 kV Vy (max): 135.88 kV Vb (max): 128.19 kV DR Trigger Time:13-06-2026 10:53:33.945 CARR RECV ZONE3 ST AR START TRIP B PH, ZONE1 TRIP, ZONE2 ST, CARR AID T, CARR SEND CB BPH OPN PREP 3PH M
--	---

	M2Z2_ST 65491, M2Z3_ST 65489 M2_CR_RC 65453 M1_TRIP 65494 CAR_TRP 65455 M CB_BO 65508 T CB_BO 65502 PR3P_TR 65442 SOTF_INIT 65480 STARTAR 65501, M2_TRIP 65493, M2Z1_OP 65492, M2Z2_ST 65491, M2Z3_ST 65489 M2_CR_RC 65453 M CB_BO 65508 CAR_TRP 65455 M CB_RO 65510 M1_TRIP 65494 M CB_YO 65509 T CB_RO 65504 T CB_YO 65503 Ir (max): 0.53 kA Iy (max): 0.39 kA Ib (max): 2.81 kA Vr (max): 161.48 kV Vy (max): 131.68 kV Vb (max): 125.86 kV	Ir (max): 0.52 kA Iy (max): 0.39 kA Ib (max): 0.60 kA Vr (max): 139.40 kV Vy (max): 135.90 kV Vb (max): 128.09 kV
--	--	--

12. A) PMU Analysis:



From the PMU plot, B-G fault can be observed with no delayed fault clearance

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

Constituent	Points for review
HIRIYUR_ZREPL	Non submission of detailed report at Zenataris end.

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

Constituent	Remedial Actions

HIRIYUR_ZREPL	Upon tripping we did the inspection of 4 Km on either side of the fault distance. During inspection we suspect some miscreant's involvement in tripping the line. After checking the nearby towers to ensure the clearance and not found any abnormalities.
---------------	---

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

16. Restoration Details:14/06/2026 00:56

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)	HIRIYUR_ZREPL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	HIRIYUR_ZREPL
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
13-06-2026 10:53:35	ZENTARIS CB 20252 (LINE TO HIRYR) INVALID	ZNTRS_CS
13-06-2026 10:53:41	ZENTARIS CB 20252 (LINE TO HIRYR) OPEN	ZNTRS_CS

Deliberations:

There was no representation by Zentarius during the Agenda item Discussion

Recommendations;

-  *M/s Zentarius to furnsih detailed report for the Grid occurance*
-  *M/s Zentarius to rectify the DR time sync issue*

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
18	Complete Outage of 220kV Pothencode SS of KSEB	As per the reports submitted, the triggering incident is the B-G fault near 220kV Pothencode Bus-2. Immediately, 220kV Bus-1 & Bus-2 BBP operated and all elements connected to 220kV Pothencode Bus-1 & Bus-2 tripped leading to complete outage of 220kV Pothencode SS	18-06-2026 08:50	0	300	GD - 1	06-07-2026	27-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, the triggering incident is the B-G fault near 220kV Pothencode Bus-2. Immediately, 220kV Bus-1 & Bus-2 BBP operated and all elements connected to 220kV Pothencode Bus-1 & Bus-2 tripped leading to complete outage of 220kV Pothencode SS

2. Time and Date of the Event (घटना का समय और दिनांक): 18-06-2026 08:50

3. Event Category (ग्रिड घटना का प्रकार): GD - 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)	3373	3136
Kerala State Generation (MW)	150	153
Grid Frequency (Hz)	50.04	50.06

SR Demand (MW)	58517	58580
SR Generation (MW)	52095	52399

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

Elements under outage	1. 220KV-EDAMON-POTHENCODE-2
Weather Condition (मौसम स्थिति)	Normal

Bus Configuration : Double Bus

Bus connectivity during antecedant condition:

Bus No.	Name of the Element
1	220KV 200MVA TRANSFORMER 1(220KV/110KV) (PERMIT WORK)
2	220KV 200MVA TRANSFORMER 2(220KV/110KV)
3(Extension of Bus -1)	220KV 200MVA TRANSFORMER 3(220KV/110KV)

BUS	Name of the Element
1	220KV 200MVA TRANSFORMER 1(220KV/110KV)
1	220kV Trivandrum-Pothencode 1
1	220kV Trivandrum-Pothencode 3
1	220kV EDAMON-POTHENCODE1
2	220KV 200MVA TRANSFORMER 2(220KV/110KV)
2	220kV Trivandrum-Pothencode 2
2	220kV EDAMON-POTHENCODE 2
1	220kV Pothencode-NEW Kattakada 1
Extension of bus -1	220KV 200MVA TRANSFORMER 3(220KV/110KV)

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	300.0 MW

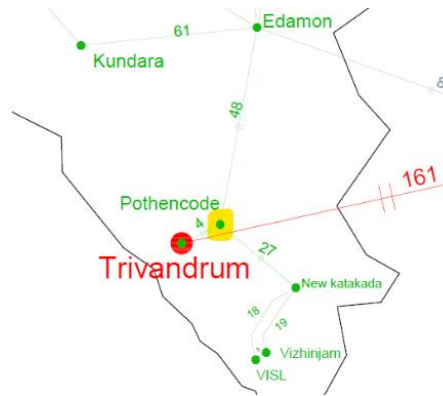
7. Duration of interruption (रुकावट की अवधि): 0 hours, 53 minutes

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

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



As per the reports submitted, the triggering incident is B-G fault due to flashover of B-phase tension insulator near 220kV Bus-2. This resulted in the operation of Bus Bar protection of both Bus-1 and Bus-2 and tripped all elements connected to 220kV buses. This led to the complete outage of 220 kV POTHENCODE SS of KSEB.

11. DR Analysis:

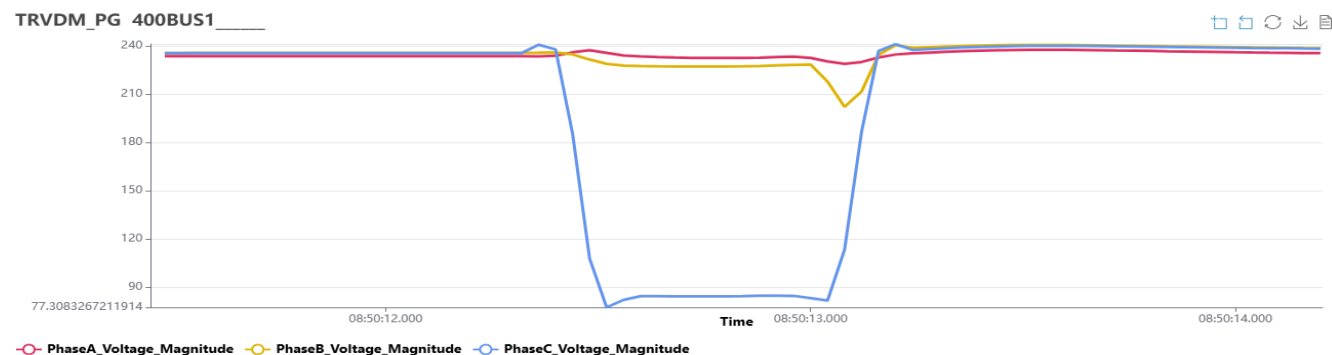
POTHENCODE - 220KV

	POTHENCODE - 220KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:18-06-0026 08:49:37.290 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): 0.74 kA Iy (max): 2.98 kA Ib (max): 2.70 kA DR Trigger Time:18-06-0026 08:49:37.290 Internal Trip, Trip 87BB, TO TRIP TC1 PH A, TO TRIP TC1 PH B, TO TRIP TC1 PH C, TO OPERATE 86XB, TO OPERATE 86XB Ext. 3 ph Trip, EXT. INTI FOR Z1 Ir (max): 0.53 kA Iy (max): 6.55 kA Ib (max): 10.07 kA DR Trigger Time:18-06-0026 08:49:37.290 Internal Trip, Trip 87BB, TO TRIP TC1 PH A, TO TRIP TC1 PH B, TO TRIP TC1 PH C, TO OPERATE 86B, TO INTI TRIP Z2 Ext. 3 ph Trip, EXT. INTI FOR Z2 Ir (max): 0.54 kA Iy (max): 6.54 kA Ib (max): 10.06 kA DR Trigger Time:18-06-0026 08:49:37.290 Internal Trip, Trip 87BB, TO TRIP TC1 PH A, TO TRIP TC1 PH B, TO TRIP TC1 PH C, TO OPERATE 86X2, TO REM. END TRIP Ir (max): 0.49 kA Iy (max): 2.79 kA Ib (max): 5.64 kA DR Trigger Time:18-06-0026 08:49:37.290 Internal Trip, Trip 87BB, TO TRIP TC1 PH A, TO TRIP TC1 PH B, TO TRIP TC1 PH C, TO OPERATE 86X2, TO REM. END TRIP Ir (max): 0.49 kA Iy (max): 2.79 kA Ib (max): 5.64 kA DR Trigger Time:18-06-0026 08:49:37.290 Internal Trip, Trip 87BB, TO TRIP TC1 PH A, TO TRIP TC1 PH B, TO TRIP TC1 PH C, TO OPERATE 86X10, TO REM. END TRIP Ir (max): 0.26 kA Iy (max): 3.05 kA Ib (max): 2.71 kA DR Trigger Time:18-06-0026 08:49:37.290 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): 0.85 kA Iy (max): 0.81 kA Ib (max): 3.64 kA DR Trigger Time:18-06-0026 08:49:37.290
--	---

	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): 0.18 kA Iy (max): 0.46 kA Ib (max): 0.59 kA
--	--

12. A) PMU Analysis:



From the PMU plot, B-G fault can be observed with delayed fault clearance.

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

Constituent	Points for review
KSEB	Delayed fault detection and clearance in BBP needs review.

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

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

16. Restoration Details:

Name of the Element	Date of Restoration (DD-MM-YYYY)	Time of Restoration (Hrs)
2EMPC 1 FEEDER	18.06.2026	09:22
200MVA 220/110KV TRANSFORMER #2	18.06.2026	09:24
200MVA 220/110KV TRANSFORMER #3	18.06.2026	09:26
1PCKZ#1 FEEDER	18.06.2026	09:27
1PCKZ#2 FEEDER	18.06.2026	09:28
1PCKZ#3 FEEDER	18.06.2026	09:30
2TVPC#1 FEEDER	18.06.2026	09:31
2TVPC#2 FEEDER	18.06.2026	09:32
2TVPC#3 FEEDER	18.06.2026	09:33
1PCPP#1 FEEDER	18.06.2026	09:35
1PCPP#2 FEEDER	18.06.2026	09:35
1PCTY FEEDER	18.06.2026	09:39
1PCAV FEEDER	18.06.2026	09:40
1NKPC FEEDER	18.06.2026	09:40
1PCAT #2 FEEDER	18.06.2026	09:40
1PCAT #1 FEEDER	18.06.2026	09:40
2PCNK#1 FEEDER	18.06.2026	09:43

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	KSEB
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

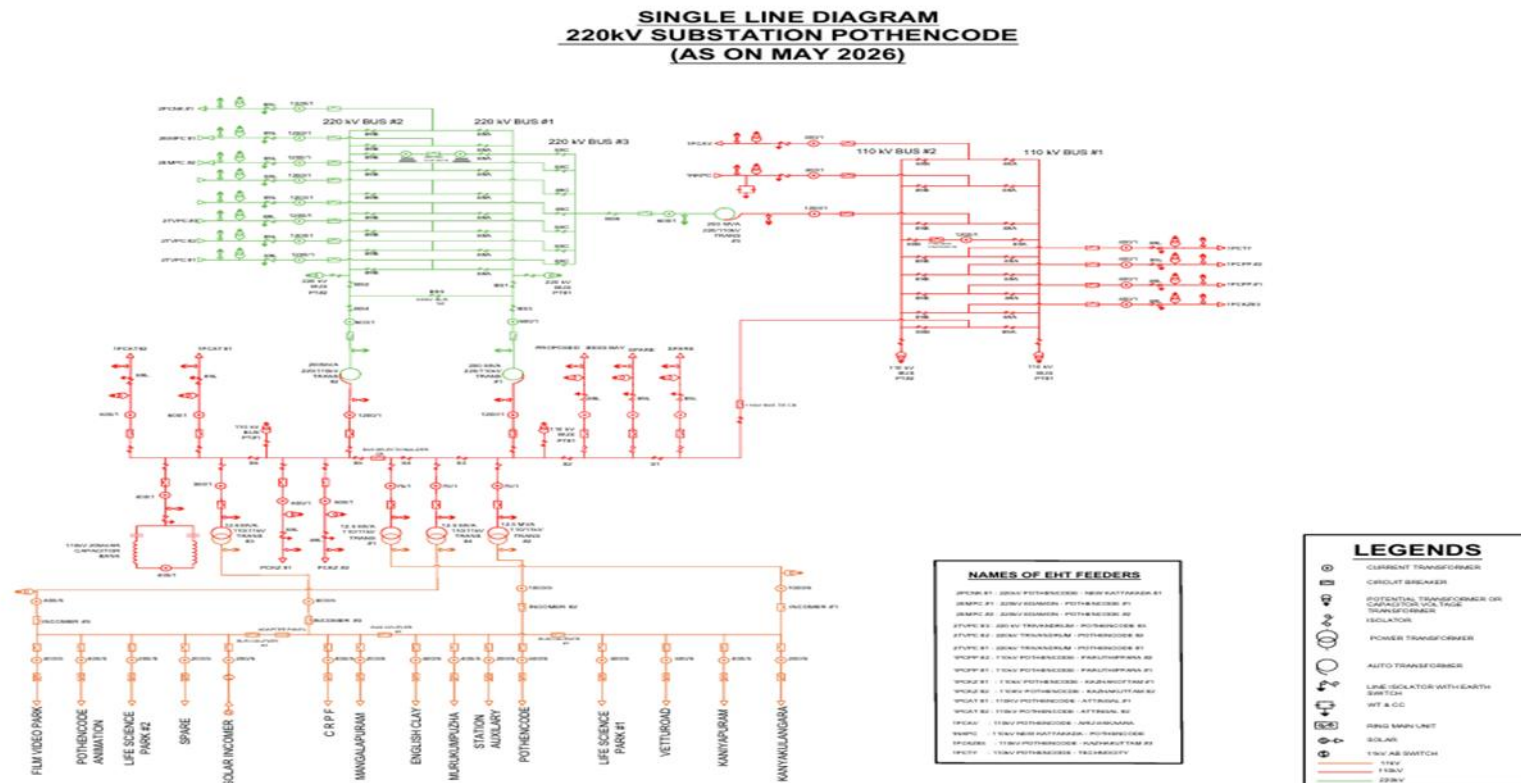
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
18-06-2026 08:50:19	POTHENCODE CB COUPLER CB 20352 OPEN	PCOD2_KL
18-06-2026 08:50:19	POTHENCODE CB 20752 (LINE-3 TO TRVDM) OPEN	PCOD2_KL
18-06-2026 08:50:24	POTHENCODE CB 10752 (T2_S) OPEN	PCOD2_KL
18-06-2026 08:50:24	POTHENCODE CB 20252 (LINE-1 TO EMON2) OPEN	PCOD2_KL
18-06-2026 08:50:24	POTHENCODE CB 20152 (LINE-1 TO KKDA2) OPEN	PCOD2_KL
18-06-2026 08:50:24	POTHENCODE CB 21052 (T2_P) OPEN	PCOD2_KL

Deliberations:

1. KSEBL stated that a major grid disturbance resulting in a total outage of 220 kV Substation Pothencode occurred on 18.06.2026 at 08:50 hrs. The incident was initiated by the flashover of a B-phase tension insulator located near Isolator 89B of the 220 kV Bus Coupler.
2. The fault resulted in the operation of the 220 kV Bus Bar Protection Scheme and subsequent tripping of all connected transmission elements, causing a complete blackout of the substation.
3. KSEBL stated that the primary fault itself was confined to Bus #2. However, the complete station outage occurred because of an incorrect busbar protection topology assumption.



4. **On detailed analysis KSEBL stated that,** the Bus Bar Protection Peripheral Unit relies on isolator status inputs to identify the actual bus configuration. For 2EMPC#2: Status of Isolator 89C was not available to the relay. As per the Alstom relay algorithm, absence of status is interpreted as “Closed”. Relay assumed Bus #1, Bus #2 and Bus #3 were interconnected.

5. Consequently, the busbar protection identified the fault as involving all three zones and simultaneously issued tripping commands to: Zone A, Zone B & Zone C. This resulted in tripping of all feeders and transformers connected to the 220 kV system and caused a total blackout of Pothencode Substation.
6. SRPC enquired about the delay in the BBP operation. KSEBL stated that due to zone segregation issues they have earlier given time delay. SRPC highlighted that BUSBAR protection should be instantaneous and requested KSEBL to ensure the same.
7. SRPC highlighted the maloperation of BBP in KSEBL network due to isolator status issues and requested KSEBL to verify the Isolator status as verification check in the internal audit of the station. KSEBL agreed to the same.
8. SRPC highlighted the DR time sync issue at Pothencode and requested KSEBL to rectify the same at earliest.

Recommendation:

-  **KSEBL to rectify DR time sync issue at Pothencode SS**
-  **KSEBL to verify Isolator status as part of Internal audit of substations.**
-  **KSEBL to disable any intentional time delay given for BBP operation.**

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
19	Complete Outage of 400kV Udangudi SS of TNPGL	400 kV UDANGUDI Generating Station is radially connected to 400 kV OTTAPIDARAM Substation through 400KV-OTTAPIDARAM-UDANGUDI-1 and 400KV-OTTAPIDARAM-UDANGUDI-2 lines. As per the reports submitted, while hand tripping of 400KV-OTTAPIDARAM-UDANGUDI-2 line (Bay-414), DT was sent to 400KV-OTTAPIDARAM-UDANGUDI-1 line bay at OTTAPIDARAM 400kV Sub station. Simultaneous tripping of both outgoing 400 kV transmission lines resulted in loss of the power evacuation path from the generating station and subsequent de-energization of the 400 kV bus. This in turn led to the tripping of 400KV/11KV UDANGUDI-ST-1 and 400KV/21KV UDANGUDI-GT-1 due to bus de-energization. This led to the complete outage of 400 kV UDANGUDI Generating station.	18-06-2026 11:56	378	0	GD - 1	26-06-2026	-	-

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

400 kV Udangudi Generating Station is radially connected to 400 kV Ottapidaram SS. As per the reports submitted, while hand tripping of 400KV-OTTAPIDARAM-UDANGUDI-2 line (Bay-414) , DT was sent to 400kV-Ottapidaram-Udangudi-1 line bay at Ottapidaram SS. Simultaneous tripping of both outgoing 400 kV lines resulted in loss of the power evacuation path from the generating station and subsequent de-energization of the 400 kV bus. This in turn led to the tripping of 400kV/11kV Udangudi-ST-1 and 400KV/21KV Udangudi-GT-1 due to bus de-energization. This led to the complete outage of 400 kV

Udangudi Generating station.

2. Time and Date of the Event (घटना का समय और दिनांक): 18-06-2026 11:56

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)	17636	17678
TamilNadu State Generation (MW)	13284	13242
Grid Frequency (Hz)	49.98	49.97
SR Demand (MW)	60224	60447
SR Generation (MW)	58331	58373

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

Bus Configuration at UDANGUDI :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-OTTAPIDARAM-UDANGUDI-2	1. 400KV-OTTAPIDARAM-UDANGUDI-1

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

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

7. Duration of interruption (रुकावट की अवधि): 0 hours, 59 minutes

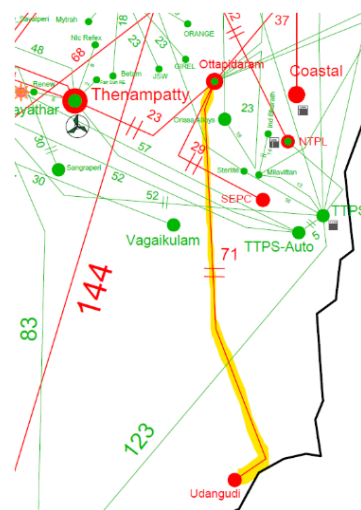
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 400KV/11KV UDANGUDI-ST-1
2. 400KV/21KV UDANGUDI-GT-1
3. UDANGUDI - 400KV
4. 400KV-OTTAPIDARAM-UDANGUDI-1

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

400 kV Udangudi Generating Station is radially connected to 400 kV Ottapidaram SS.



As per the reports submitted, while hand tripping of 400kV-Ottapidaram-Udangudi-2 line (Bay-414) , DT was sent to 400kV-Ottapidaram-Udangudi-1 line bay of Ottapidaram SS from Udangudi end and the line tripped. Simultaneous tripping of both outgoing 400 kV lines resulted in loss of the power evacuation path from the generating station and subsequent de-energization of the 400 kV bus. This in turn led to the tripping of 400kV/11kV Udangudi-ST-1 and 400KV/21KV Udangudi-GT-1 due to bus de-energization. This led to the complete outage of 400 kV Udangudi Generating station.

11. DR Analysis:

400KV-OTTAPIDARAM-UDANGUDI-1

	OTTAPIDARAM - 400KV	UDANGUDI - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:18-06-2026 11:55:28.383 DIC1 DT RCV 1, DIC1 DT RCV 1 BLK_CMD1 DIA2 MCB Y OP, DIA3 MCB B OP, DIA4 TCB R OP, DIA5 TCB Y OP, DIA6 TCB B OP DIA1 MCB R OP Ir (max): 0.22 kA Iy (max): 0.24 kA Ib (max): 0.22 kA Vr (max): 248.98 kV Vy (max): 247.07 kV Vb (max): 249.47 kV	DR Trigger Time:18-06-2026 11:55:28.320 Ir (max): 0.25 kA Iy (max): 0.26 kA Ib (max): 0.25 kA Vr (max): 247.01 kV Vy (max): 243.49 kV Vb (max): 245.92 kV DR Trigger Time:18-06-2026 11:56:48.071 FAULT TRIGGERING ON (VO93), PHASE OV1 PKP Ir (max): 0.09 kA Iy (max): 0.08 kA Ib (max): 0.08 kA Vr (max): 263.85 kV Vy (max): 240.37 kV Vb (max): 238.91 kV

UDANGUDI - 400KV

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

400KV/11KV UDANGUDI-ST-1

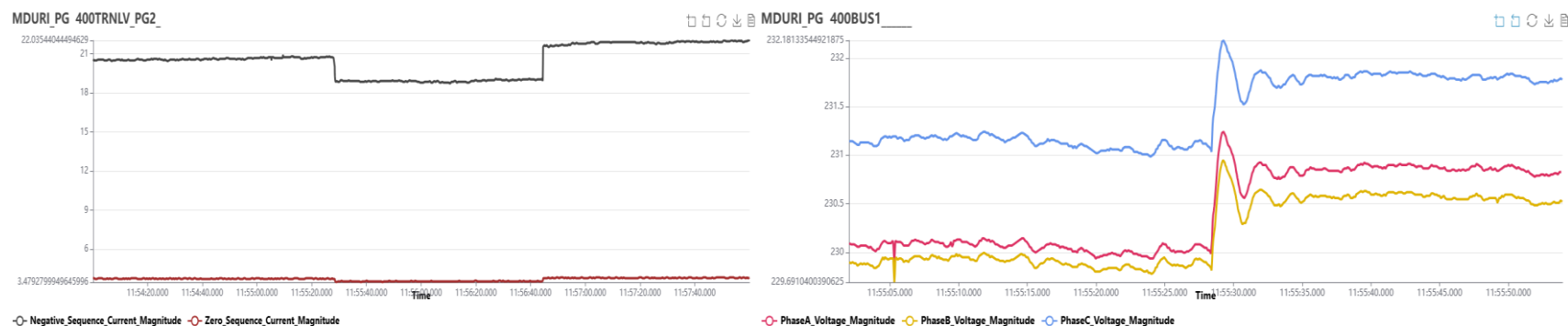
	UDANGUDI - 400KV
Time Sync Issue	No

DR Analysis	Loss of power supply
-------------	----------------------

400KV/21KV UDANGUDI-GT-1

	UDANGUDI - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:18-06-2026 11:56:48.184 Any Start L10 KSK C/O FAIL Ir (max): 0.06 kA Iy (max): 0.03 kA Ib (max): 0.06 kA

12. A) PMU Analysis:



From the pmu plot, it can be observed that no fault occurred.

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

Constituent	Points for review
TNPGCL	Sending of DT to Ottapidaram end in 400kV-Ottapidaram-Udangudi-1 during manual tripping of 400kV-Ottapidaram-Udangudi-2 needs review.

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

Constituent	Remedial Actions
TNPGCL	After charging Ottapidaram Line-1 the 400kV Bus supply restored. False Indication came and rectified, found normal.

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

After charging Ottapidaram Line-1 the 400kV Bus supply 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)	TNPGCL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TNPGCL
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
18-06-2026 11:55:33	UDANGUDI TPS CB TIE 13 - CB 41352 BETWEEN	UDGD4_TG
18-06-2026 11:55:35	UDANGUDI TPS CB TIE 13 - CB 41352 OPEN	UDGD4_TG
18-06-2026 11:55:37	OTTAPIDARAM 400 CB TIE 08 - CB 40852 OPEN	OTPM4_TN
18-06-2026 11:55:39	OTTAPIDARAM 400 CB TIE 07 - CB 40752 OPEN	OTPM4_TN
18-06-2026 11:55:39	OTTAPIDARAM 400 CB TIE 09 - CB 40952 OPEN	OTPM4_TN
18-06-2026 11:56:54	UDANGUDI TPS CB TIE 04 - CB 40452 OPEN	UDGD4_TG
18-06-2026 11:56:54	UDANGUDI TPS CB UNIT 1 CB 00452G OPEN	UDGD4_TG
18-06-2026 11:56:54	UDANGUDI TPS CB TIE 05 - CB 40552 OPEN	UDGD4_TG

Deliberations:

There was no representation by TNPGL during the Agenda item Discussion

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
20	Complete outage of 765kV NCPS of TANTRANSCO and 765kV NCTPS Generating station of TNPGL	765kV NCTPS Stage-II generating station is evacuating power through 765 kV NCPS–NCTPS STG3-1 and 765 kV NCPS–NCTPS STG3-2, while 765 kV Ariyalur–NCPS-1 and 765 kV Ariyalur–NCPS-2 were also in service. The triggering incident is issuance of a spurious Direct Trip (DT) signal from the Main-2 at NCPS to the remote ends, resulting in the tripping of 765 kV NCPS–NCTPS STG3-1 and STG3-2 at the NCTPS end and 765 kV Ariyalur–NCPS-1 and 2 at the Ariyalur end. This led to complete outage of 765kV NCPS of TANTRANSCO and 765kV NCTPS Generating station of TNPGL	20-06-2026 16:07	522	0	GD - 1	29-06-2026	21-06-2026 22-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

765kV NCTPS Stage-II generating station is evacuating power through 765 kV NCPS–NCTPS STG3-1 and 765 kV NCPS–NCTPS STG3-2, while 765 kV Ariyalur–NCPS-1 and 765 kV Ariyalur–NCPS-2 were also in service. The triggering incident is a issuance of a spurious Direct Trip (DT) signal from the Main-2 at NCPS to the remote ends, resulting in the tripping of 765 kV NCPS–NCTPS STG3-1 and 2 at the NCTPS end and 765 kV Ariyalur–NCPS-1 and 2 at the Ariyalur end. This led to complete outage of 765kV NCPS of TANTRANSCO and 765kV NCTPS Stage-3Generating station of TNPGL

2. Time and Date of the Event (घटना का समय और दिनांक: 20-06-2026 16:07

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)	18374	18741
TamilNadu State Generation (MW)	9905	9805
Grid Frequency (Hz)	50.09	49.99
SR Demand (MW)	61164	61253
SR Generation (MW)	53516	53228

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

Elements under outage	1. NCTPS STG3 - 765KV - Bus 1 2. NCTPS STG3 - 765KV - Bus 2 3. 765KV/27KV NCTPS STG3-GT-1 4. NCTPS STG3 - UNIT 1
Weather Condition (मौसम स्थिति)	Normal

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

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

7. Duration of interruption (रुकावट की अवधि): 2 hours, 13 minutes

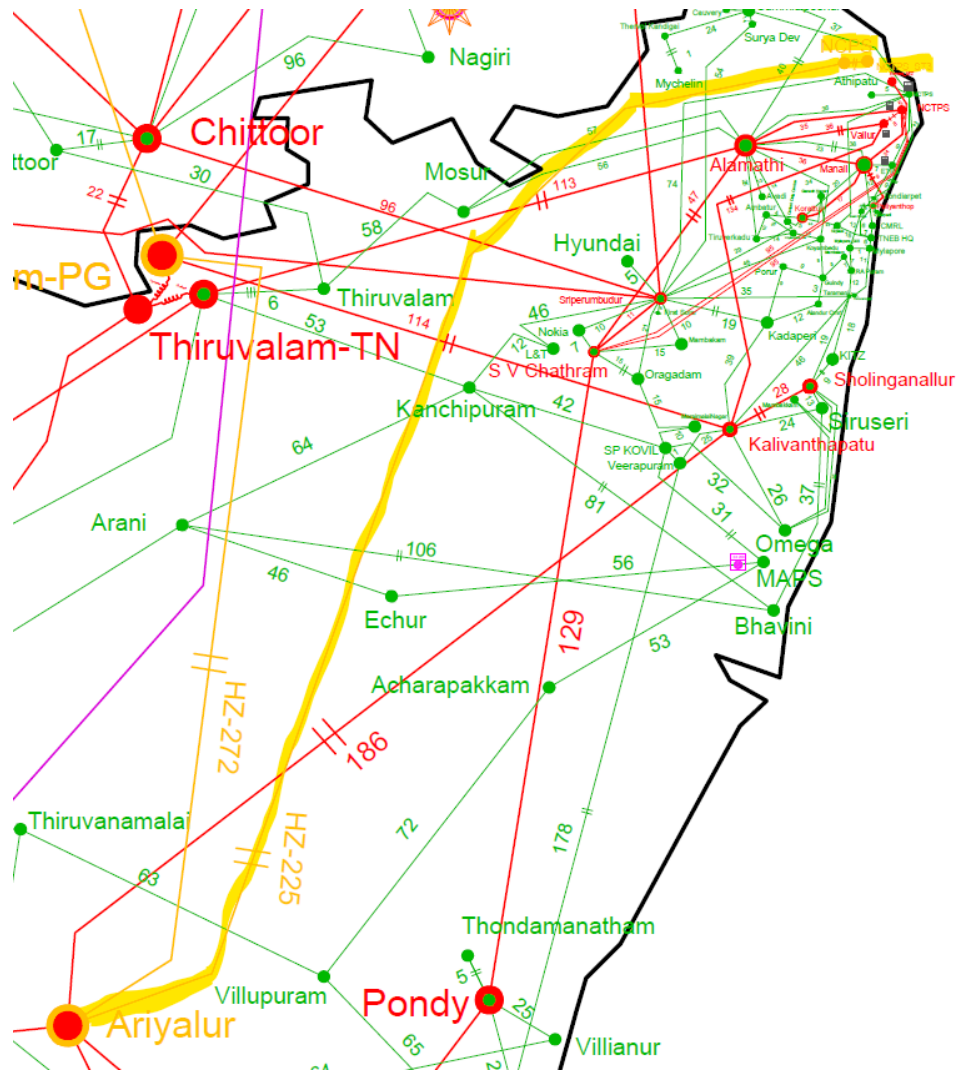
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 765KV-NCPS-NCTPS STG3-1
2. 765KV-NCPS-NCTPS STG3-2
3. 765KV/27KV NCTPS STG3-GT-1
4. NCTPS STG3 - UNIT 1

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

765kV NCTPS Stage-II generating station is evacuating power through 765 kV NCPS–NCTPS STG3-1 and 765 kV NCPS–NCTPS STG3-2, while 765 kV Ariyalur–NCPS-1 and 765 kV Ariyalur–NCPS-2 were also in service. The triggering incident is an issuance of a spurious Direct Trip (DT) signal from the Main-2 at NCPS to the remote ends, resulting in the tripping of 765 kV NCPS–NCTPS STG3-1 and 2 at the NCTPS end and 765 kV Ariyalur–NCPS-1 and 2 at the Ariyalur end. This led to complete outage of 765kV NCPS of TANTRANSCO and 765kV NCTPS Stage-3 Generating station of TNPGL



11. DR Analysis:

765KV-ARIYALUR-NCPS-1

	ARIYALUR - 765KV	NCPS - 765KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:20-06-2026 16:07:42.028 ANY TRIP ON (VO41), 21.DT RC-2 ON (CI21) TRIP PHASE A, TRIP PHASE B, TRIP PHASE C, TRIP 3-POLE 14.MN GRP-A TRP CLOSED (CO14), 15.TIE GRP-A TRP CLOSED (CO15) 19.MN AR BLK ON (CI19), 20.T AR BLK ON (CI20) 1.MN CB RPH OPN ON (CI1), 2.MN CB YPH OPN ON (CI2), 3.MN CB BPH OPN ON (CI3), 12.GRP-B OPTD ON (CI12), 13. T CB RPH OPN ON (CI13), 14.T CB YPH OPN ON (CI14), 15.T CB BPH OPN ON (CI15) OPEN POLE OP A OPEN POLE OP B OPEN POLE OP C OPEN POLE OP A OPEN POLE OP A OPEN POLE OP A OPEN POLE OP A OPEN POLE OP A OPEN POLE OP A OPEN POLE OP C	

	PHASE UV1 OP Ir (max): 0.34 kA Iy (max): 0.45 kA Ib (max): 0.37 kA Vr (max): 611.73 kV Vy (max): 575.97 kV Vb (max): 644.39 kV	
--	--	--

765KV-ARIYALUR-NCPS-2

	ARIYALUR - 765KV	NCPS - 765KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:20-06-2026 16:07:42.027 ANY TRIP ON (VO41), 21.DT RC-2 ON (CI21) TRIP PHASE A, TRIP PHASE B, TRIP PHASE C, TRIP 3-POLE 14.MN GRP-A TRP CLOSED (CO14), 15.TIE GRP-A TRP CLOSED (CO15) 19.MN AR BLK ON (CI19), 20.T AR BLK ON (CI20) 12.GRP-B OPTD ON (CI12) 1.MN CB RPH OPN ON (CI1), 2.MN CB YPH OPN ON (CI2), 3.MN CB BPH OPN ON (CI3), 13. T CB RPH OPN ON (CI13), 15.T CB BPH OPN ON (CI15) 14.T CB YPH OPN ON (CI14) OPEN POLE OP B OPEN POLE OP C OPEN POLE OP A ANY TRIP ON (VO41), 21.DT RC-2 ON (CI21)	

	TRIP PHASE A, TRIP PHASE B OPEN POLE OP C OPEN POLE OP A OPEN POLE OP A OPEN POLE OP A OPEN POLE OP C OPEN POLE OP A OPEN POLE OP C PHASE UV1 OP Ir (max): 0.34 kA Iy (max): 0.31 kA Ib (max): 0.37 kA Vr (max): 610.16 kV Vy (max): 574.63 kV Vb (max): 643.37 kV	
--	--	--

NCTPS STG3 - 765KV

	NCTPS STG3 - 765KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:20-06-2026 16:08:10.016 F<2 Trip, Any Trip Power2 Trip V/Hz>4 Trip 4 HVCB/GCB OPEN Power2 Trip Ir (max): 6.33 kA Iy (max): 6.33 kA Ib (max): 6.34 kA Vr (max): 16.91 kV Vy (max): 16.84 kV Vb (max): 16.76 kV

NCPS - 765KV

	NCPS - 765KV
Time Sync Issue	No

DR Analysis	
-------------	--

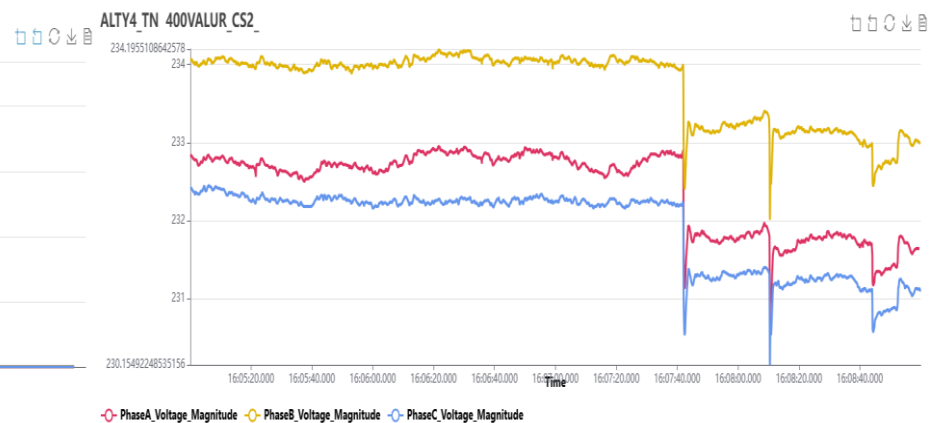
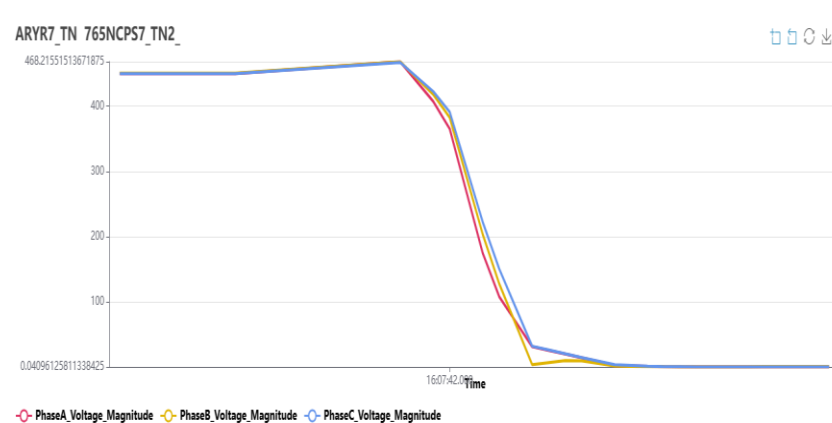
765KV-NCPS-NCTPS STG3-1

	NCPS - 765KV	NCTPS STG3 - 765KV
Time Sync Issue	No	No
DR Analysis		

765KV-NCPS-NCTPS STG3-2

	NCPS - 765KV	NCTPS STG3 - 765KV
Time Sync Issue	No	No
DR Analysis		

12. A) PMU Analysis:



From the PMU data, the triggering incident was observed at 16:07:41 hrs. During this incident, a change in the voltage of Ariyalur Bus-2 was observed

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

Constituent	Points for review
TANTRANSCO	Direct Trip (DT) signal from the Main-2 DTPC (NSD570) at NCPS needs review.

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

Constituent	Remedial Actions
TANTRANSCO	1. Main.2 DTPC kept out of service & referred to OEM(M/s. ABB) 2. Frequent SNTF failure observed in all DTPCs. This is also referred to OEM for rectification.

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

765kV NCPS_Ariyalur_1:20-06-2026 at 18:20hrs

765kV NCPS_Ariyalur_2:20-06-2026 at 18:24hrs

765kV NCPS_NCTPS Stage.3_1:20-06-2026 at 21:15hrs

765kV NCPS_NCTPS Stage.3_2:20-06-2026 at 21:17hrs

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	TNPGCL

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

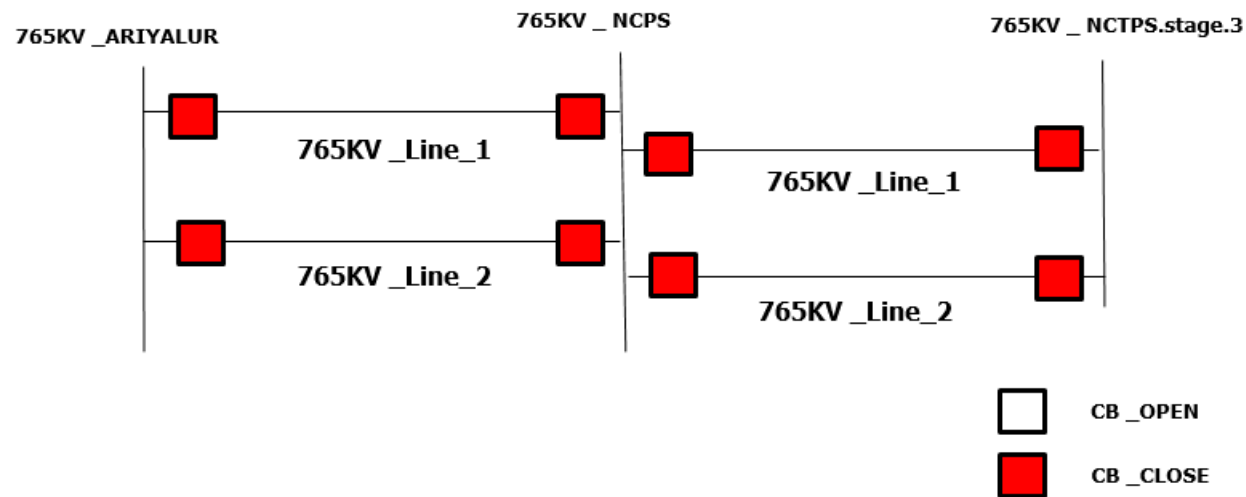
Annexure 1

Sequence of Events as per SCADA

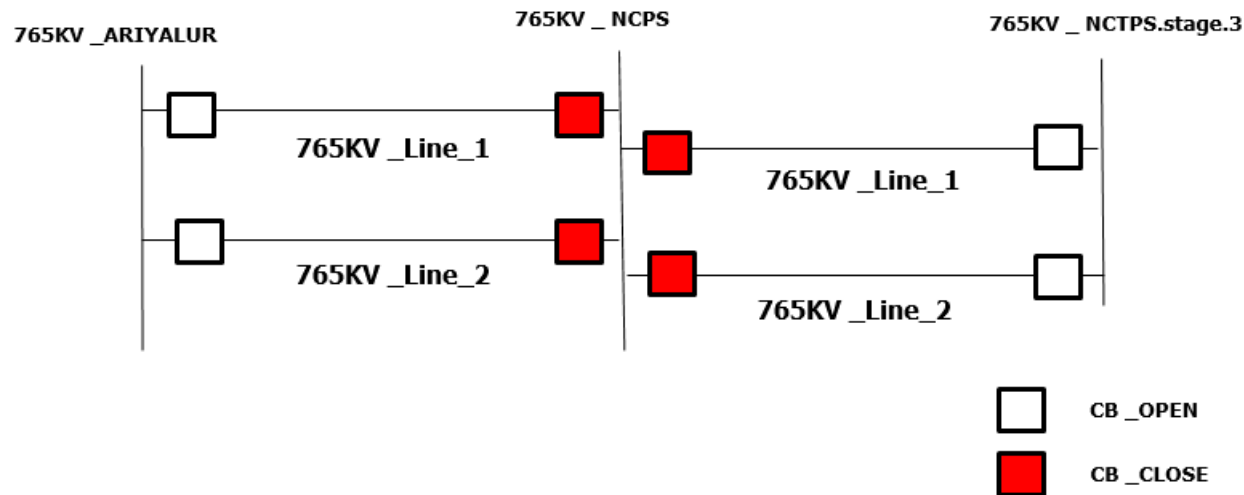
time	Event	Location
20-06-2026 15:16:13	NORTH CHN 765 CB REACTOR CB 70652R OPEN	NCPS7_TN

Deliberations:

1. TANTRANSCO stated that in the antecedent condition 765kV NCPS Pooling station and 765kV NCTPS Generating station are radially connected through 765kV Ariyalur NCPS Line-1&2. 765kV Ariyalur - NCPS Line-1 & Line -2 were in service.



2. TANTRANSCO stated that the triggering incident was direct trip extended from Main.2 DTPC (ABB_ NSD 570) of all feeders connected in NCPS station. Spurious DT signal generated from Main.2 DTPC (ABB_ NSD 570) of all 765kV of NCPS end



3. TANTRANSCO confirmed that No DC disturbance was reported during the incident. Only Main.2 DTPC (ABB_NSD 570) extended spurious DT signal to remote end. All bays at NCPS end found holding.
4. **Remedial Action:**
 - A special meeting was conducted with ABB on 22.06.2026 & relevant event files were furnished to R&D team of ABB for analyzing. Reply awaited.
 - CH-2 Carrier Selector Switch was put into "Out" mode, feeder was putback into service.
5. SRPC requested to ensure healthiness of Channel -1 for carrier. TANTRANSCO confirmed that channel-1 is healthy.

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-1 of 220kV VTPS Generating Station of APGENCO	As per the reports submitted, the triggering incident was Y-B fault in 220kV VTPS Rentachinthala Line-1. At VTPS end, B-pole did not open causing 220kV Bus-1 LBB to operate. Immediately, 220kV VTPS Bus-1 LBB operated and all elements connected to the Bus-1 tripped. This led to the Tripping of 220kV Bus-1 at 220kV VTPS Generating Station of APGENCO	25-05-2026 17:08	457	0	GI-1	11-06-2026	09-06-2026	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 Y-B fault in 220kV VTPS Rentachinthala Line-1. At VTPS end, B-pole did not open causing 220kV Bus-1 LBB to operate. Immediately, 220kV VTPS Bus-1 LBB operated and all elements connected to the Bus-1 tripped. This led to the Tripping of 220kV Bus-1 at 220kV VTPS Generating Station of APGENCO

2. Time and Date of the Event (घटना का समय और दिनांक): 25-05-2026 17:08

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)	11846	11765
Andhra Pradesh State Generation (MW)	8598	8137
Grid Frequency (Hz)	49.98	49.97
SR Demand (MW)	56652	56578
SR Generation (MW)	53123	53000

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

Elements under outage	1. 220KV-VTPS-RENTACHINTHALA-2
Weather Condition (मौसम स्थिति)	Thunders

Bus configuration at VTPS:

Bus Configuration Type : Double main and transfer bus scheme

Bus Coupler Status : NA

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

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

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

7. Duration of interruption (रुकावट की अवधि): 0 hours, 28 minutes

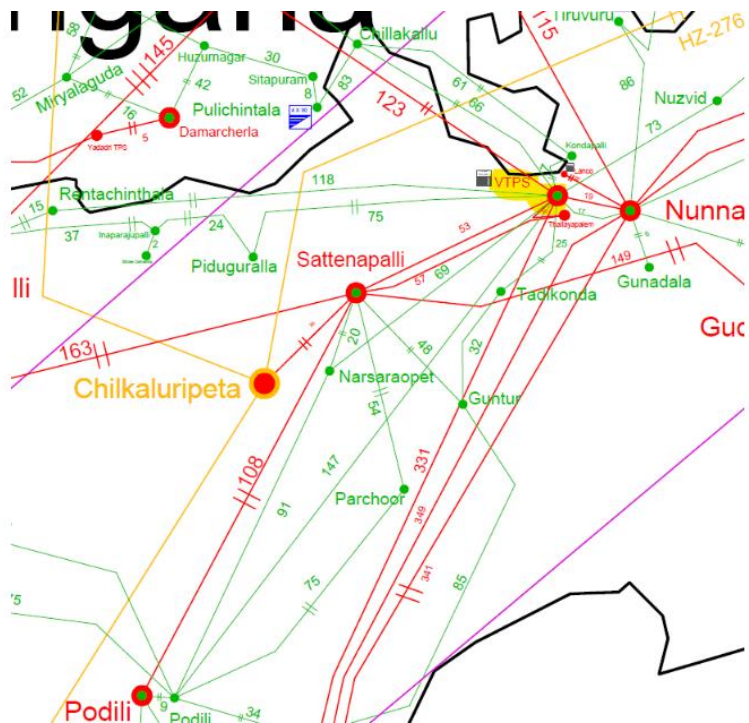
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-VTPS-PIDUGURALLA-1
2. 220KV-TADIKONDA-VTPS-1
3. 220KV-VTPS-CHILLAKALLU-1
4. 220KV-GUNADALA-VTPS-1
5. 220KV-KONDAPALLI-VTPS-1
6. 220KV-VTPS-PODILI-1
7. 220KV-VTPS-RENTACHINTHALA-1

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

220kV VTPS Rentachinthala Line-1 is connected to Bus-1 at VTPS. As per the reports submitted, the triggering incident was Y-B fault in 220kV VTPS Rentachinthala Line-1. At Rentachinthala end, the fault was sensed in Z1 and 3ph tripped. At VTPS end, the fault was sensed in Z1, and where in Y and R poles got opened, but B-pole current was still conducting and LBB operated after around 200ms and all elements connected to the Bus-1 tripped (220KV-VTPS-PIDUGURALLA-1, 220KV-TADIKONDA-VTPS-1, 220KV-VTPS-CHILLAKALLU-1, 220KV-GUNADALA-VTPS-1, 220KV-KONDAPALLI-VTPS-1, 220KV-VTPS-PODILI-1, 220KV-VTPS-RENTACHINTHALA-1, VTPS-U1, VTPS-U4, VTPS-U5). This led to the Tripping of 220kV Bus-1 at 220kV VTPS Generating Station of APGENCO and due to the tripping of U1, U4 and U5 led to a generation loss of around 457MW.



11. DR Analysis:

VTPS - 220KV

	VTPS - 220KV
Time Sync Issue	No
DR Analysis	Bus Outage

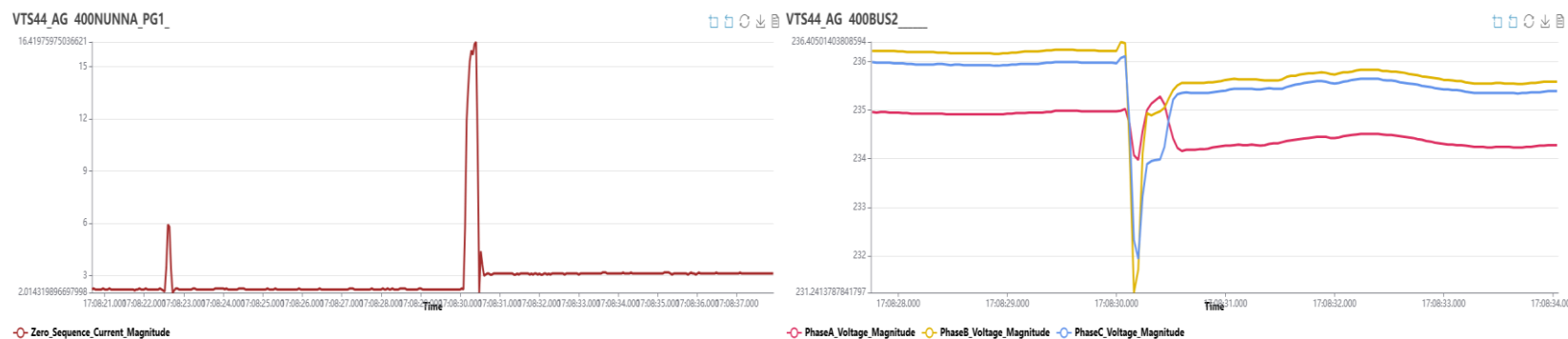
220KV-VTPS-RENTACHINTHALA-1

	VTPS - 220KV	RENTACHINTHALA - 220KV
Time Sync Issue	No	No

DR Analysis	DR Trigger Time:25-05-2026 17:08:30.150 Any Trip, DIST Trip A, DIST Trip B, DIST Trip C, Z1, M_CB R PH TRIP, M_CB Y PH TRIP, M_CB B PH TRIP, T_BC R PH TRIP, T_BC Y PH TRIP, T_BC B PH TRIP, CARR SEND, TRIP 86 B, ANNUNCIATION, TRIP 86 R, TRIP 86 Y, TRIP 86 B CARR RECEIVED CB OPEN BB OPTD, BB OPTD Ir (max): 0.09 kA Iy (max): 3.15 kA Ib (max): 2.93 kA Vr (max): 131.07 kV Vy (max): 131.47 kV Vb (max): 131.26 kV DR Trigger Time:25-05-2026 17:08:30.140 OSC Trigger On, POWER SWING 50DD PH DIST Z4 PKP PH DIST Z2 PKP, PH DIST Z3 PKP PH DIST Z2 PKP, PH DIST Z3 PKP, PH DIST Z4 PKP ZONE 1 TRIP On, PUTT TX1, PH DIST Z1 PKP PUTT OP, CARR RCVD On CB R-PH STAT Off, CB B-PH STAT Off BKR OPEN On, CB Y-PH STAT Off, GND DIST Z2 PKP, GND DIST Z3 PKP	DR Trigger Time:25-05-2026 17:08:30.149 DIST Fwd DIST Trip A, DIST Trip B, DIST Trip C, DIST Sig. Send, Z1, AR Lockout Shot>, BAR, ZONE-1 R PH TRIP, ZONE-1 Y PH TRIP, ZONE-1 B PH TRIP, 86A OPTD, 86B OPTD 86A&B+96 OP DIST UNB CR MCB B PH OPEN MCB R PH OPEN, MCB Y PH OPEN Ir (max): 0.05 kA Iy (max): 7.19 kA Ib (max): 6.91 kA Vr (max): 138.92 kV Vy (max): 135.19 kV Vb (max): 133.75 kV
-------------	---	---

	OSC Trigger On, BB/LBB/RE_TR On POWER SWING 50DD Ir (max): 0.09 kA Iy (max): 2.99 kA Ib (max): 2.91 kA Vr (max): 150.39 kV Vy (max): 128.69 kV Vb (max): 128.05 kV	
--	--	--

12. A) PMU Analysis:



From PMU, dip in Y-B fault is observed indicating Y-B fault during the event with delayed fault clearance.

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

Constituent	Points for review
APGENCO	1. Non opening/current conduction of the breaker leading to LBB operation needs review 2. Non-availability of Re-Trip needs review 3. Non-sending of DT to remote ends for LBB operation needs review

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

Constituent	Remedial Actions
-------------	------------------

APGENCO	1. The B phase Chamber of Rentachintala-1 CB has to be inspected
---------	--

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

16. Restoration Details: 25/05/2026 17:36

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
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

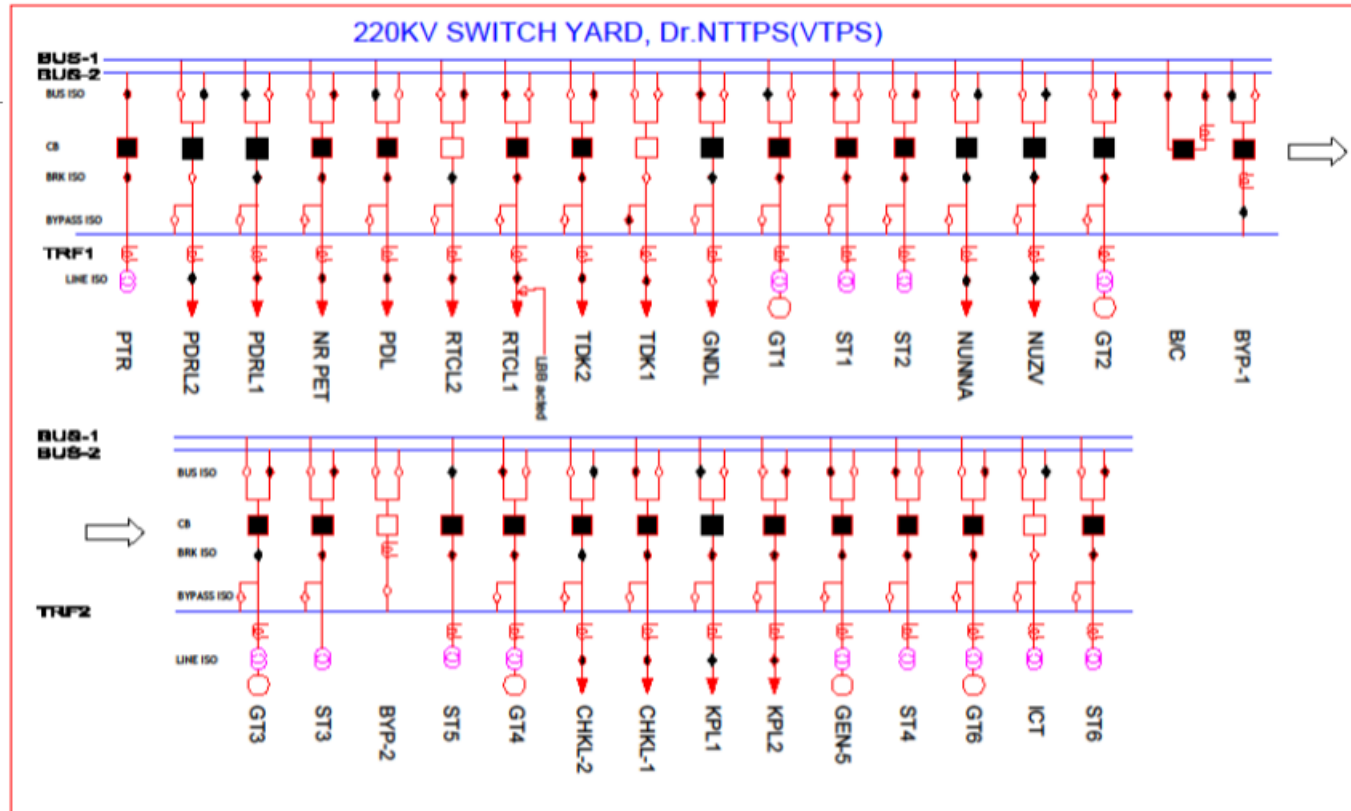
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
25-05-2026 17:08:40	VTPS OLD STAGE CB COUPLER CB 21552 OPEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB 22652 (T4_P) OPEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB CB 22052 (GT-4) OPEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB COUPLER CB 21652 OPEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB 20352 (LINE TO PDLI2) BETWEEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB 22852 (LINE-1 TO PDGR2) OPEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB 23352 (T5_P) BETWEEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB 21052 (T1_P) OPEN	VTSO2_AG
25-05-2026 17:08:40	VTPS OLD STAGE CB 22252 (LINE-1 TO CLKL2) OPEN	VTSO2_AG

Deliberations:

1. APGENCO stated that in the antecedent conditions their switchyard is operating under Two Main BUS with Bus coupler and Transfer Bus arrangement. Always the Bus coupler is in closed condition.



2. APGENCO stated that on 25.05.2026, Y-B fault occurred in 220kV VTPS Rentachinthala Line-1. At VTPS end, B-pole open feedback has come but current in the B-phase persisted for more than 200msec. Hence LBB to operated and all elements connected to the Bus-1 tripped. This led to the Tripping of 220kV Bus-1.
3. **Remedial action taken:**
 - The faulty CB has been replaced with new CB and the feeder is taken into service on 08.06.2026 at 17.08hrs.
 - 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 the reason for non sending of DT to remote end. APGENCO stated that output relay 3 is assigned instead of output relay 4 in the Busbar Bay Unit. Which is rectified and assigned to output relay4.
5. SRPC enquired regarding the non-operation of the Re-trip (Trip Repeat) function during the event. APGENCO stated that, in the Siemens 7SS52 Busbar Protection Scheme, the configured "CBF Trp.rp.3p" (Circuit Breaker Failure Trip Repeat – Three Pole) function requires the "Current Release – 3 Pole" condition to become active. This function is activated only when the current exceeds 200 mA in more than two phases. In the present event, the current exceeded 200 mA only in the B-phase, and therefore the "Current Release – 3 Pole" condition was not satisfied. Consequently, the Trip Repeat command was not issued. APGENCO further informed that, to avoid recurrence of such incidents, the configuration has been modified by selecting the "CBF Trp.rp.Lx" option, which is expected to resolve the issue.

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 of 220kV Lower Sileru PH of APGENCO	As per the reports submitted, while hand tripping the bus coupler at 220kV Lower Sileru PH, 220kV Lower Sileru chintur Line-1, 220kV Asupaka Lower Sileru Line-1 and Lower Sileru Unit-1 which are connected to 220kV Bus-2 of Lower Sileru PH tripped on Directional earth fault protection. Tripping of all these elements led to loss of power supply to 220kV Bus-2 of 20kV Lower Sileru PH	26-05-2026 00:12	100	0	GI-1	08-06-2026	01-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, while hand tripping the bus coupler at 220kV Lower Sileru PH, 220kV Lower Sileru chintur Line-1, 220kV Asupaka Lower Sileru Line-1 and Lower Sileru Unit-1 which are connected to 220kV Bus-2 of Lower Sileru PH tripped on Directional earth fault protection. Tripping of all these elements led to loss of power supply to 220kV Bus-2 of 20kV Lower Sileru PH

2. Time and Date of the Event (घटना का समय और दिनांक): 26-05-2026 00:12

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Andhra Pradesh State Demand (MW)	12018	11944
Andhra Pradesh State Generation (MW)	9518	9401

Telangana State Demand (MW)	9621	9591
Telangana State Generation (MW)	5591	5591
Grid Frequency (Hz)	49.88	49.89
SR Demand (MW)	54164	54045
SR Generation (MW)	55830	55670

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At Lower Sileru SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

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

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

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

7. Duration of interruption (रुकावट की अवधि): 0 hours, 35 minutes

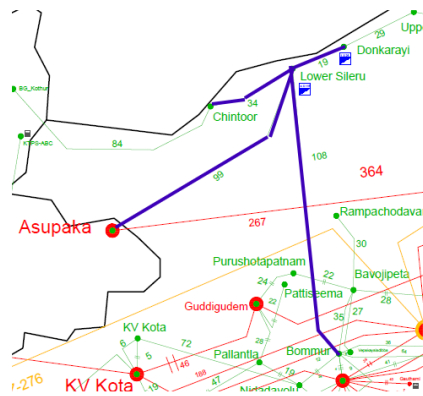
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

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

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

As per the reports submitted, at 21:39 hrs Unit-1 was synchronized to the grid on Bus-1, followed by synchronization of Unit-2 at 21:59 hrs on Bus-2, with the Bus Coupler breaker maintained in the open position. At 23:22 hrs, Unit-2 was de-synchronized from the grid on Bus-2, and subsequently at 23:37 hrs, the Bus Coupler breaker was closed as per APLDC instructions. At 00:11 hrs, the 220 kV Bus Coupler breaker opened, and the operator physically verified that all three phases were in the open condition. During this period, BRC and VT fuse failure annunciations were observed on both the Asupaka and Chinthuru feeders, and simultaneously both feeders tripped at the remote end on Directional earth fault protection , with Unit-1 also tripping on earth fault. After receiving the closing code, the 220 kV Chinthuru feeder was hand-tripped and the Asupaka feeder was charged; however, the BRC annunciation did not reset. Thereafter, upon receiving the opening code, the Asupaka feeder was opened at both ends and the Chinthuru feeder was charged, yet the BRC annunciation remained unreset, and a current of 185 A was observed flowing in the R-phase only. Based on these observations, it was concluded that the R-phase limb of the Bus Coupler breaker had not fully opened internally. Tripping of both 220kV Bus-2 connected lines led to loss of power supply to 220kV Lower Sileru Bus-2.



11. DR Analysis:

220KV-ASUPAKA-LOWER_SILERU-1

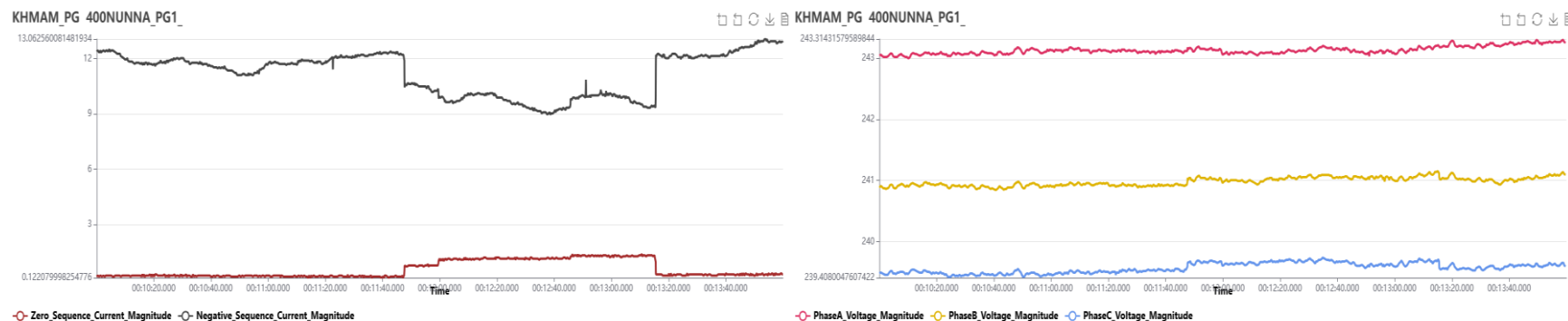
	ASUPAKA - 220KV	LOWER_SILERU - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:26-05-2026 00:13:15.480 NEUTRAL TOC2 OP TRIPBUS 2 OP, MCB 86A/B TR On	DR Trigger Time:26-05-2026 00:12:04.600 Brok.Cond. Alarm, R13 M-1 BRC ANN Ir (max): 0.16 kA Iy (max): 0.02 kA

	86A OPTD On SRC1 VT FF OP, CB Y PH OPEN On, CB B PH OPEN On CB R PH OPEN On PHASE SELECT MULTI-P, PHASE SELECT CA PHASE SELECT AG Ir (max): 0.24 kA Iy (max): 0.05 kA Ib (max): 0.05 kA Vr (max): 133.01 kV Vy (max): 150.96 kV Vb (max): 148.76 kV DR Trigger Time:26-05-2026 00:13:15.501 86B TRIP OPTD Ir (max): 0.24 kA Iy (max): 0.05 kA Ib (max): 0.05 kA Vr (max): 133.29 kV Vy (max): 149.78 kV Vb (max): 147.54 kV	Ib (max): 0.02 kA Vr (max): 131.80 kV Vy (max): 140.68 kV Vb (max): 132.46 kV
--	--	---

LOWER_SILERU - 220KV

	LOWER_SILERU - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:26-05-2026 00:12:04.600 Brok.Cond. Alarm, R13 M-1 BRC ANN Ir (max): 0.16 kA Iy (max): 0.02 kA Ib (max): 0.02 kA Vr (max): 131.80 kV Vy (max): 140.68 kV Vb (max): 132.46 kV

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
APGENCO	Non opening bus coupler R-pole limb at Lower Sileru.

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

Constituent	Remedial Actions
APGENCO	Opened Bus Coupler breaker both Bus-1 and Bus-2 isolators and charged 220KV Chinthuru feeder at 2.19 Hrs and stood ok. After getting closing code, the 220KV Asupaka feeder charged at 2.34 hrs., and stood ok.

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

16. Restoration Details:

At 02:09 Hrs, the Bus-Coupler Breaker both Bus-1 and Bus-2 isolators opened and the 220KV Lower Sileru-Chinthuru feeder charged on Bus-2 at 02:19 Hrs and the 220KV Lower Sileru-Asupaka feeder charged on Bus-2 at 02:37 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)	APGENCO
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

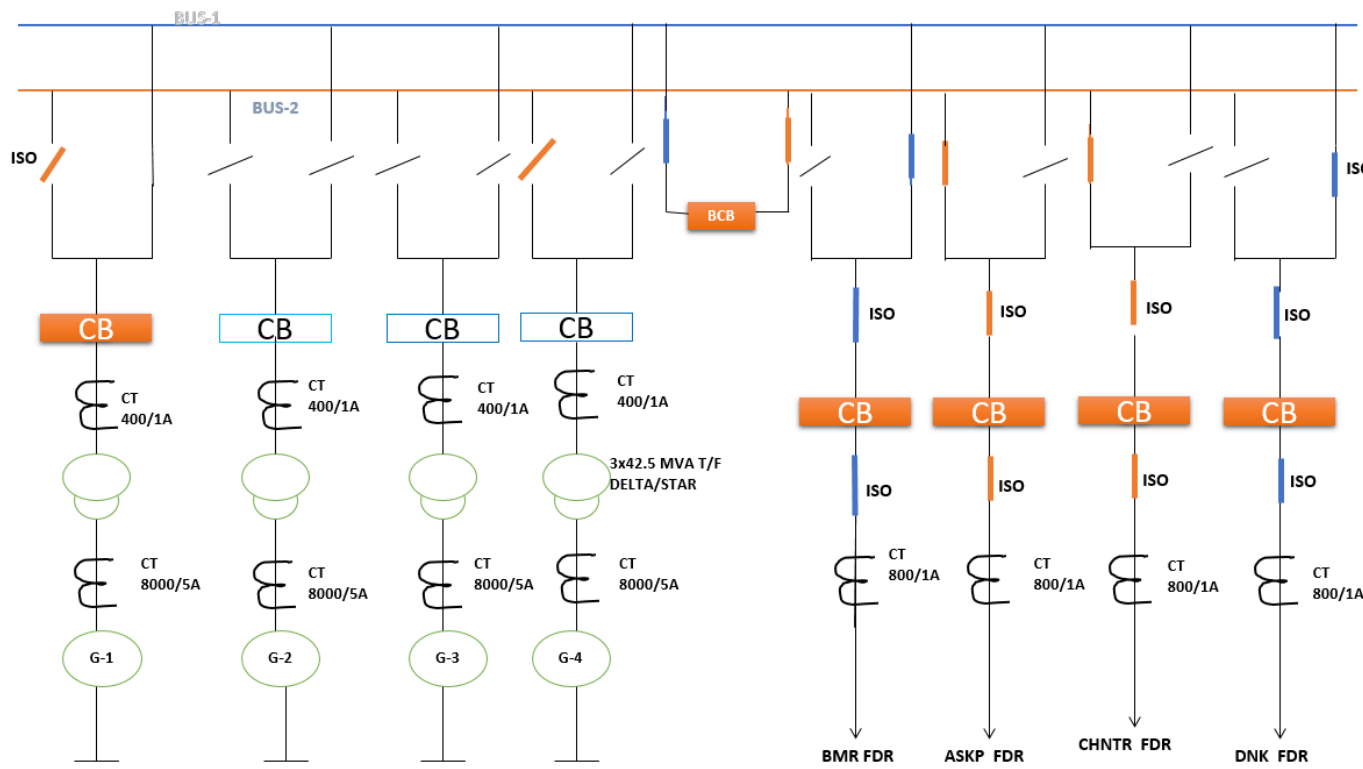
Sequence of Events as per SCADA

time	Event	Location
26-05-2026 00:12:06	LOWER SILERU CB CB 20752 (GT-1) OPEN	LSLR2_AG
26-05-2026 00:37:10	LOWER SILERU CB CB 20752 (GT-1) BETWEEN	LSLR2_AG
26-05-2026 00:37:32	LOWER SILERU CB CB 20752 (GT-1) OPEN	LSLR2_AG
26-05-2026 00:47:55	LOWER SILERU CB 20152 (LINE TO ASPK4) OPEN	LSLR2_AG

Deliberations:

1. APGENCO stated that during the antecedent condition the Bus-Coupler Breaker is in closed Condition.
 - a. 220 KV Bommuru and Donkarayi feeders and Unit-1 on Bus-1.
 - b. 220 KV Asupaka and Chinthuru feeders on Bus-2.

BUS CONNECTED ELEMENTS DURING ANTECEDENT CONDITION



2. APGENCO stated that At 21:39 Hrs, the Unit-1 synchronized to the grid on Bus-1. At 23:37 Hrs, the Bus-Coupler Breaker closed as per the APLD instructions. APLD instructed the Lower Sileru shift operator to open the Bus-Coupler breaker. At 00:11 Hrs., During the Bus-Coupler Breaker opening condition 220 KV Lower Sileru-Chinthuru and Lower Sileru-Asupaka feeders tripped at remote end due to operation of the non-directional earth fault protection and unit-1 tripped on HV standby earth fault protection at LS end.
3. APGENCO stated that after getting closing code 220KV Chinthuru feeder hand tripped and charged 220KV Asupaka feeder and observed that BRC annunciation not getting resetted. After getting opening code 220KV Asupaka feeder opened at both ends and charged 220 KV Chinthuru feeder and

observed that BRC annunciation not getting resetted.And also observed 185 amps flowing in R-phase only. So it was concluded that bus-coupler breaker R-phase limb not fully opened internally. The operator physically checked and confirmed that all three phases opened but R-ph limb not opened internally causing both feeders tripped at remote end.

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 400kV and 220kV Bus-1 at Gajwel of TGTRANSCO	During the antecedent condition, 400KV-GAJWEL-NARSAPUR-2, 400KV-RAMADUGU-GAJWEL-1 and 400KV-RAMADUGU-GAJWEL-2 was under outage. As per the reports submitted, the triggering incident is 220kV Bus-1 B-ph Bus PT failure leading to the operation of 220kV BBP and tripping of all elements connected to 220kV Bus-1 at Gajwel. During the same time, 400kV Bus-1 also tripped due to LBB maloperation. This led to the Tripping of 400kV and 220kV Bus-1 at Gajwel of TGTRANSCO.	27-05-2026 06:02	0	0	GI-2	15-06-2026	10-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During the antecedent condition, 400KV-GAJWEL-NARSAPUR-2, 400KV-RAMADUGU-GAJWEL-1 and 400KV-RAMADUGU-GAJWEL-2 was under outage. As per the reports submitted, the triggering incident is 220kV Bus-1 B-ph Bus PT failure leading to the operation of 220kV BBP and tripping of all elements connected to 220kV Bus-1 at Gajwel. During the same time, 400kV Bus-1 also tripped due to LBB maloperation. This led to the Tripping of 400kV and 220kV Bus-1 at Gajwel of TGTRANSCO.

2. Time and Date of the Event (घटना का समय और दिनांक): 27-05-2026 06:02

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Telangana State Demand (MW)	7551	7535
Telangana State Generation (MW)	5123	5143
Grid Frequency (Hz)	50.09	50.08
SR Demand (MW)	45755	45542
SR Generation (MW)	46727	46515

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

Elements under outage	1. 400KV-RAMADUGU-GAJWEL-1 2. 400KV-RAMADUGU-GAJWEL-2 3. 400KV-GAJWEL-NARSAPUR-2
Weather Condition (मौसम स्थिति)	Rainy , Thunders , Windy

Bus Configuration of 400 kV side at Gajwel 400/220/132kV SS :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-GAJWEL-CHANDALAPUR-1 2. 400KV-GAJWEL-CHANDALAPUR-2 3. 400KV-GAJWEL-RAMAGUNDAM-1 4. 400KV-GHANAPUR-GAJWEL-1	1. 400KV-GAJWEL-NARSAPUR-2 2. 400KV-GAJWEL-NARSAPUR-1 3. 400KV/220KV GAJWEL-ICT-2 4. 400KV/220KV GAJWEL-ICT-4 5. 400KV/220KV GAJWEL-ICT-3 6. 400KV/220KV GAJWEL-ICT-1

Bus Configuration of 220 kV side at Gajwel 400/220/132kV SS :

Bus Configuration Type : Double main and transfer bus scheme

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-GAJWEL-AKKARAM-1 2. 220KV-GAJWEL-KONDAPAKKA-1 3. 220KV-SIDDIPET-GAJWEL-1 4. 220KV-MEDCHAL-GAJWEL-1 5. 400KV/220KV GAJWEL-ICT-2 6. 400KV/220KV GAJWEL-ICT-1 7. 220KV-MINPUR-GAJWEL-1	1. 220KV-GAJWEL-KAMAREDDY-1 2. 220KV-MINPUR-GAJWEL-2 3. 220KV-SIDDIPET-GAJWEL-2 4. 220KV-GAJWEL-AKKARAM-2 5. 220KV-MEDCHAL-GAJWEL-2 6. 400KV/220KV GAJWEL-ICT-4 7. 400KV/220KV GAJWEL-ICT-3

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, 43 minutes

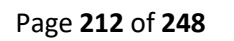
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

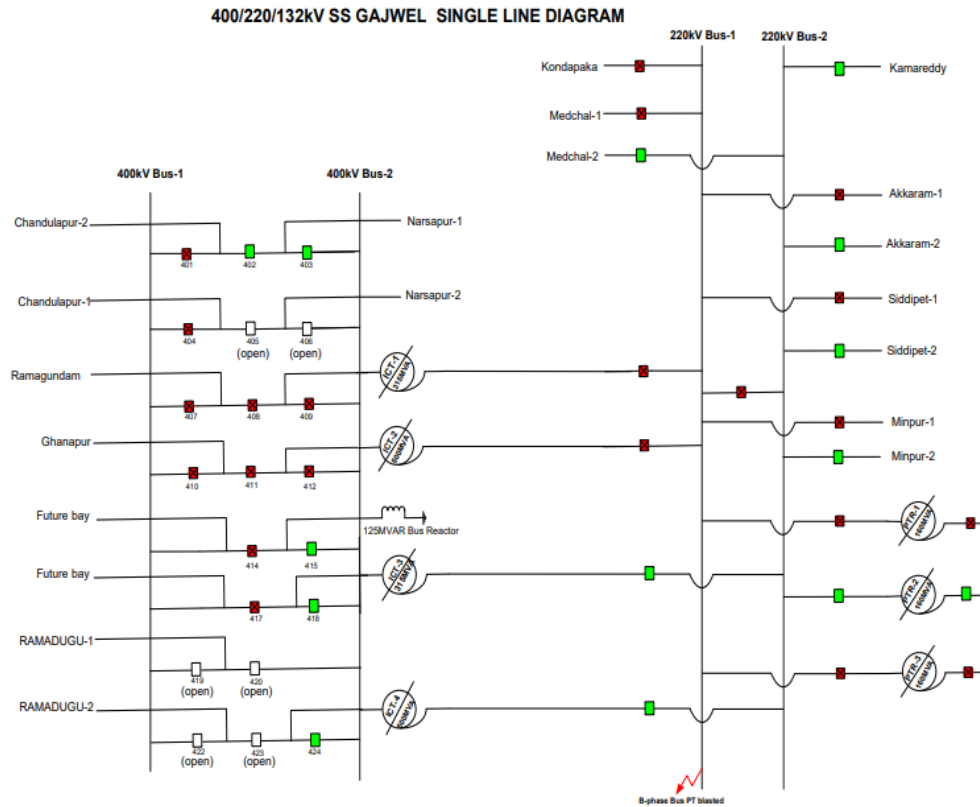
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 400KV/220KV GAJWEL-ICT-1
2. 400KV/220KV GAJWEL-ICT-2
3. 400KV-GAJWEL-RAMAGUNDAM-1
4. 400KV-GHANAPUR-GAJWEL-1
5. GAJWEL - 400KV - Bus 1
6. GAJWEL - 220KV - Bus 1
7. 400KV-GAJWEL-CHANDALAPUR-1

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

During the antecedent condition, 400KV-GAJWEL-NARSAPUR-2 was under outage from 26-05-2026 21:40 Hrs, 400KV-RAMADUGU-GAJWEL-1 was under outage from 26-05-2026 21:40 Hrs and 400KV-RAMADUGU-GAJWEL-2 was under outage from 26-05-2026 21:54 Hrs. Since 400KV-GAJWEL-NARSAPUR-2 was under out condition, 400KV-GAJWEL-CHANDALAPUR-1 was only connected to 400kV Bus-1.





As per reports submitted, on 27-05-2026 at 06:02hrs, 220kV B-phase Bus-1 PT blasted causing 220kV Bus-1 busbar protection operation and tripped all the elements connected to 220kV Bus-1 at 400/220/132kV SS Gajwel. 315MVA ICT-1 & 500MVA ICT-2 HV breakers (Main & Tie) tripped on inter trip. With the tripping of the ICT-1 and 2 HV side breakers (main and tie) and hence 400KV-GAJWEL-RAMAGUNDAM-1 and 400KV-GHANAPUR-GAJWEL-1 were only connected to 400kV Bus-1. During the event, Bus Reactor Tie breaker (directly connected to bus-1 because of half dia) PU relay initiated backtrip command to CU without any external LBB relay initiation and immediately led to the tripping of all main breakers connected to 400kV Bus-1 but the BR breaker(415) did not trip and was holding. This led to the Tripping of 400kV and 220kV Bus-1 at Gajwel of TGTRANSCO and further as 400KV-GAJWEL-CHANDALAPUR-1, 400KV-GAJWEL-RAMAGUNDAM-1 and 400KV-GHANAPUR-GAJWEL-1 were only connected to 400kV Bus-1 and tripping of 400kV Bus-1 led to the tripping of 400KV-GAJWEL-CHANDALAPUR-1, 400KV-GAJWEL-RAMAGUNDAM-1 and 400KV-GHANAPUR-GAJWEL-1. However, DT was not sent to 400KV-GAJWEL-CHANDALAPUR-1, 400KV-GAJWEL-RAMAGUNDAM-1 and 400KV-GHANAPUR-GAJWEL-1.

11. DR Analysis:

400KV/220KV GAJWEL-ICT-1

	GAJWEL - 400KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:27-05-2026 06:03:19.823 Device FltDet, Device Trip, BB Trip L123 Ir (max): 4.70 kA Iy (max): 4.70 kA Ib (max): 4.70 kA

400KV/220KV GAJWEL-ICT-2

	GAJWEL - 400KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:27-05-2026 06:03:19.826 Device FltDet, Device Trip, BB Trip L123 Ir (max): 9.99 kA Iy (max): 9.99 kA Ib (max): 9.99 kA

400KV-GAJWEL-RAMAGUNDAM-1

	GAJWEL - 400KV	RAMAGUNDAM - 400KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:27-05-2026 06:01:04.912 Any Trip, Internal Trip, Relay Label 01, Relay Label 02, Relay Label 03, Trip 50BF (CU) Ir (max): 0.29 kA Iy (max): 0.11 kA Ib (max): 0.41 kA	DR Trigger Time:27-05-2026 06:02:59.588 PHS-STPE PHS-STFWL3 DEF_START PHS-STFW1PH PHS-STPP Ir (max): 0.30 kA Iy (max): 0.57 kA Ib (max): 1.50 kA Vr (max): 240.15 kV Vy (max): 241.06 kV Vb (max): 239.24 kV

400KV-GHANAPUR-GAJWEL-1

	GHANAPUR - 400KV	GAJWEL - 400KV
Time Sync Issue	No	Yes
DR Analysis	DR not triggered.	DR Trigger Time:27-05-2026 06:01:04.911 Any Trip, Internal Trip, Relay Label 01, Relay Label 02, Relay Label 03, Trip 50BF (CU) Ir (max): 0.31 kA Iy (max): 0.57 kA Ib (max): 1.18 kA

GAJWEL - 400KV

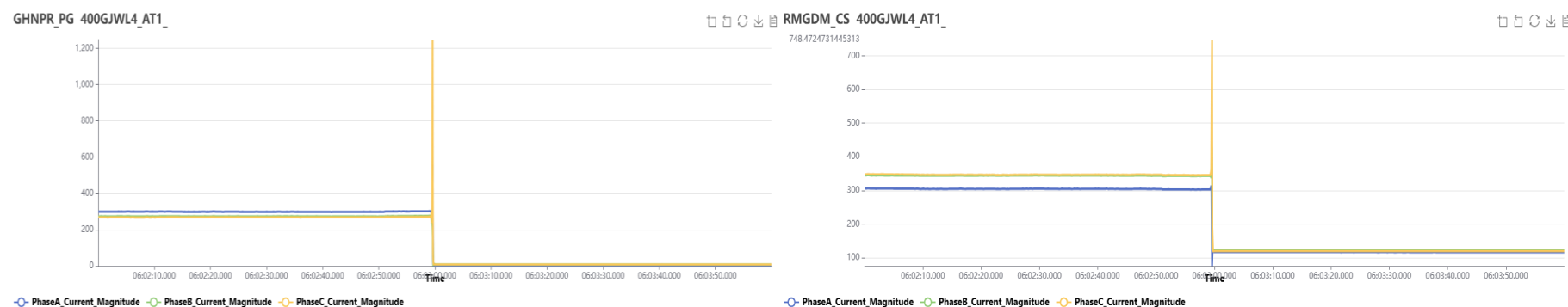
	GAJWEL - 400KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:27-05-2026 06:01:04.903 Ext. 3 ph Trip Any Trip, Breaker Failure, CBF Ext Backtrip Any Trip, Internal Trip, Relay Label 01, Relay Label 02, Relay Label 03, Trip 50BF (CU) Ir (max): 0.25 kA Iy (max): 0.26 kA Ib (max): 0.92 kA DR Trigger Time:27-05-2026 06:01:04.911 Trip 50BF Zone 1, Trip 50BF Ir (max): 0.10 kA Iy (max): 0.10 kA Ib (max): 0.11 kA

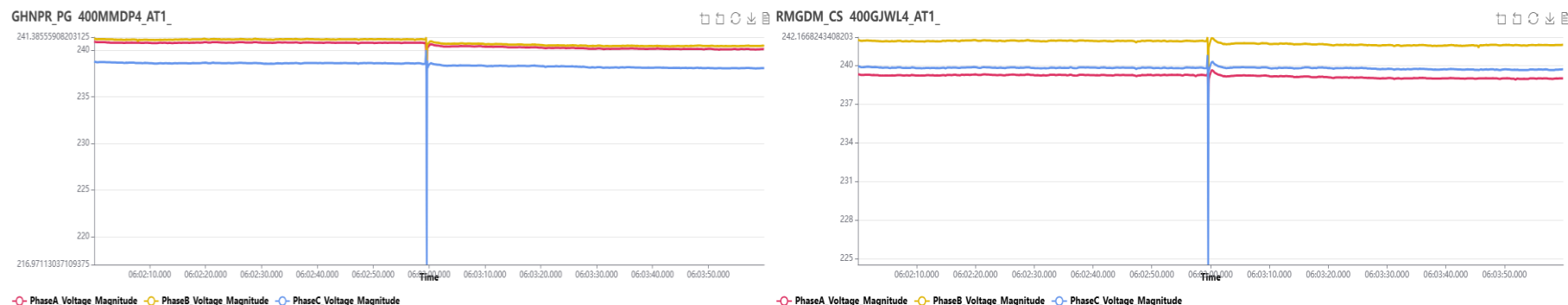
GAJWEL - 220KV

	GAJWEL - 220KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:27-05-2026 06:03:19.613 Trip BBP G_MCU 7SS522 V4.7, Trip BUS1 G_MCU 7SS522 V4.7, Device FltDet_1_897B_7SS525 V3.3, Device Trip_1_897B_7SS525 V3.3, BB Trip L123_1_897B_7SS525 V3.3 Device FltDet_3_897B_7SS525 V3.3, Device

	FltDet_7_897B_7SS525 V3.3, Device Trip_7_897B_7SS525 V3.3, BB Trip L123_7_897B_7SS525 V3.3, Device FltDet_9_897B_7SS525 V3.3, Device Trip_9_897B_7SS525 V3.3, BB Trip L123_9_897B_7SS525 V3.3, Device FltDet_10_897B_7SS525 V3.3, Device Trip_10_897B_7SS525 V3.3, BB Trip L123_10_897B_7SS525 V3.3, Device FltDet_14_897B_7SS525 V3.3, Device Trip_14_897B_7SS525 V3.3, BB Trip L123_14_897B_7SS525 V3.3, Device FltDet_16_897B_7SS525 V3.3, Device FltDet_19_897B_7SS525 V3.3, Device Trip_19_897B_7SS525 V3.3, BB Trip L123_19_897B_7SS525 V3.3, Device FltDet_23_897B1_7SS525 V3.3 Device Trip_3_897B_7SS525 V3.3, BB Trip L123_3_897B_7SS525 V3.3, Device Trip_16_897B_7SS525 V3.3, BB Trip L123_16_897B_7SS525 V3.3, Device Trip_23_897B1_7SS525 V3.3, BB Trip L123_23_897B1_7SS525 V3.3 Device FltDet_6_897B_7SS525 V3.3, Device Trip_6_897B_7SS525 V3.3, BB Trip L123_6_897B_7SS525 V3.3 Ir (max): 0.55 kA Iy (max): 0.55 kA Ib (max): 0.55 kA
--	--

12. A) PMU Analysis:





From the PMU plot, tripping of 400KV-GHANAPUR-GAJWEL-1 and 400KV-GAJWEL-RAMAGUNDAM-1 line at Gajwel end can be observed with line holding at remote ends.

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

Constituent	Points for review
TGTRANSCO	- Unwanted operation of LBB by bus reactor tie breaker PU relay and tripping of 400kV Bus-1 needs review - Non opening of 415 BR breaker for LBB operation needs review - Non sending of DT to remote ends during non availability of tie breaker and LBB operation (400kV Bus-1)

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

Constituent	Remedial Actions
TGTRANSCO	Replaced the damaged 220KV Bus-1 PT and charged the Bus. Replaced the suspected cable of reactor tie bay LBB relay to tie PU on 05-06-2026 Rectified the CU & PU DRs GPS time sync issue on 27-05-2026.

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

16. Restoration Details:

Sl. No.	Voltage Level (kV)	Name of the Element	Date of Restoration (DD-MM-YYYY)	Time of Restoration (Hrs)
1	400kV	Ramagundam	27-05-2026	10:46
2	400kV	315MVA ICT-1	27-05-2026	10:48
3	400kV	Ghanapur	27-05-2026	10:48
4	400kV	500MVA ICT-2	27-05-2026	10:53
5	400KV	Bus-1	27-05-2026	20:06
6	220KV	Bus-1	27-05-2026	20:36
7	220kV	Kondapaka	27-05-2026	20:36
8	220kV	Medchal-1	27-05-2026	20:42
9	220kV	Akkaram-1	27-05-2026	21:01
10	220KV	Bus coupler	27-05-2026	21:16
11	220kV	160MVA PTR-1	27-05-2026	09:21
12	220kV	Siddipet-1	27-05-2026	21:44
13	220kV	Minpur -1	27-05-2026	21:51
14	220kV	160MVA PTR-3	27-05-2026	07:45

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

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

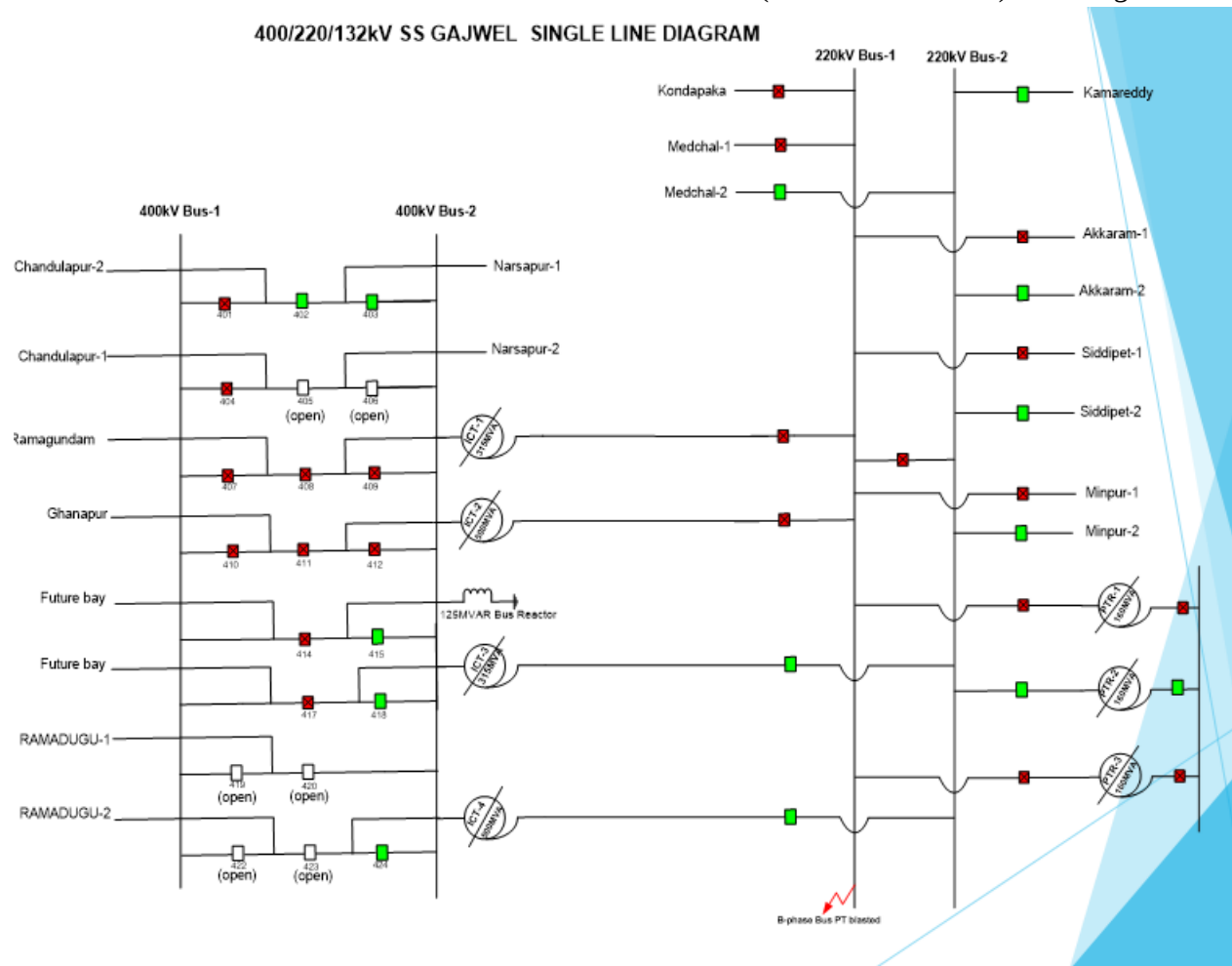
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
27-05-2026 06:03:07	GAJWEL CB 11052 (T3_S) OPEN	GJWL4_AT
27-05-2026 06:03:07	GAJWEL CB 21452 (T3_P) OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB 21652 (LINE-1 TO AKRM2) OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB 20752 (T1_S) OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB 20652 (LINE-1 TO MDCL2) OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB 20352 (LINE-1 TO MNPR2) OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB TIE 01 - CB 40152 OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB TIE 08 - CB 40852 OPEN	GJWL4_AT
27-05-2026 06:03:13	GAJWEL CB COUPLER CB 21152 OPEN	GJWL4_AT

Deliberations:

1. TGTRANSCO stated that, under the antecedent conditions, heavy gale and lightning were prevailing in the vicinity of the 400/220/132 kV Gajwel Substation.
2. TGTRANSCO informed that, on 27.05.2026 at 06:02 hrs, the 220 kV Bus-1 B-phase Potential Transformer (PT) failed, resulting in the operation of the 220 kV Bus-1 Busbar Protection, which tripped all the elements connected to 220 kV Bus-1 at 400/220/132 kV Gajwel Substation. The tripping of the 315 MVA ICT-1 and 500 MVA ICT-2 HV breakers (Main and Tie) through inter-trip was stated to be in order.



3. TGTRANSCO further stated that, simultaneously, the 400 kV Bus-1 Local Breaker Backup (LBB) Protection operated and tripped all the elements connected to 400 kV Bus-1 at the substation.

4. TGTRANSCO informed that analysis of the Disturbance Records (DRs) revealed that, although there was no fault associated with the Bus Reactor Tie Breaker (directly connected to Bus-1 under the one-and-a-half breaker configuration), the Protection Unit (PU) relay initiated a back-trip command to the Control Unit (CU) without any external LBB initiation, resulting in the tripping of all elements connected to 400 kV Bus-1. TGTRANSCO stated that the issue has been referred to the OEM for detailed investigation.
5. SRPC highlighted the GPS time synchronization issues observed in the 400 kV CU and PU Disturbance Records. TGTRANSCO acknowledged the issue and informed the forum that the GPS time synchronization would be rectified at the earliest.

6. Remedial Actions taken:

- Replaced the damaged 220KV Bus-1 PT and charged the Bus.
- Replaced the suspected cable of reactor tie bay LBB relay to tie PU on 05-06-2026.
- Rectified the CU & PU GPS time sync issue on 27-05-2026.

Recommendations:

 **TGTRANSCO to rectify the DR TIME SYNC issues at Gazwel 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	Tripping of 400kV Bus-2 of 400kV Alamathy SS of TANTRANSCO	As per the reports submitted, the triggering incident was R-G fault in 400kV Alamathy-Manali line due to failure of R phase supporting insulator which eventually caused R-G fault in 400kV Bus-2. Immediately, 400kV Bus-2 BBP operated and all main breakers connected to 400kV Bus-2 tripped. This led to loss of power supply to 400kV Alamathy Bus-2.	03-06-2026 18:00	0	0	GI-2	19-06-2026	12-06-2026	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 400kV Alamathy-Manali line due to failure of R phase supporting insulator which eventually caused R-G fault in 400kV Bus-2. Immediately, 400kV Bus-2 BBP operated and all main breakers connected to 400kV Bus-2 tripped. This led to loss of power supply to 400kV Alamathy Bus-2.

2. Time and Date of the Event (घटना का समय और दिनांक): 03-06-2026 18:00

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)	18091	17227
TamilNadu State Generation (MW)	8187	7473
Grid Frequency (Hz)	50.09	50.2
SR Demand (MW)	52816	51499

SR Generation (MW)	48118	46880
--------------------	-------	-------

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Rainy

At 400kV Alamathy SS:

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-VALLUR-ALAMATHY-1 2. 400KV-ALAMATHY-SUNGAVARACHATRAM-1 3. 400KV-ALAMATHY-TIRUVALAM_TN-2 4. 400KV/110KV ALAMATHY-ICT-2 5. 400KV/230KV ALAMATHY-ICT-3 6. 400KV/230KV ALAMATHY-ICT-5 7. 400KV-ALAMATHY-NCTPS_STAGE_II-2	1. 400KV-VALLUR-ALAMATHY-2 2. 400KV-ALAMATHY-SUNGAVARACHATRAM-2 3. 400KV-ALAMATHY-TIRUVALAM_TN-1 4. 400KV-ALAMATHY-MANALI-1 5. 400KV/110KV ALAMATHY-ICT-1 6. 400KV/230KV ALAMATHY-ICT-4 7. 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): 0 hours, 6 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/230KV ALAMATHY-ICT-4
2. 400KV/110KV ALAMATHY-ICT-1
3. 400KV-VALLUR-ALAMATHY-2
4. 400KV-ALAMATHY-MANALI-1
5. 400KV-ALAMATHY-NCTPS_STAGE_II-1

6. 400KV-VALLUR-ALAMATHY-2

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

At 18:00hrs:

Due to heavy wind and rain, At 400kV Alamathy SS at 18.00 hrs, the triggering incident was R-G fault in 400kV Alamathy-Manali line due to failure of R phase supporting insulator . At both ends, the fault was sensed in zone-1. At Alamathy end, A/R operated and the line tripped on persistent fault. During the second fault after A/R dead time the fault developed into R-G fault in 400kV Alamathy 400kV Bus-2. Immediately, 400kV Bus-2 BBP operated and all main breakers connected to 400kV Bus-2 tripped. This led to loss of power supply to 400kV Alamathy Bus-2. At Manali end, the fault was sensed in zone-1. After A/R dead time A/R did not operate and the line tripped.



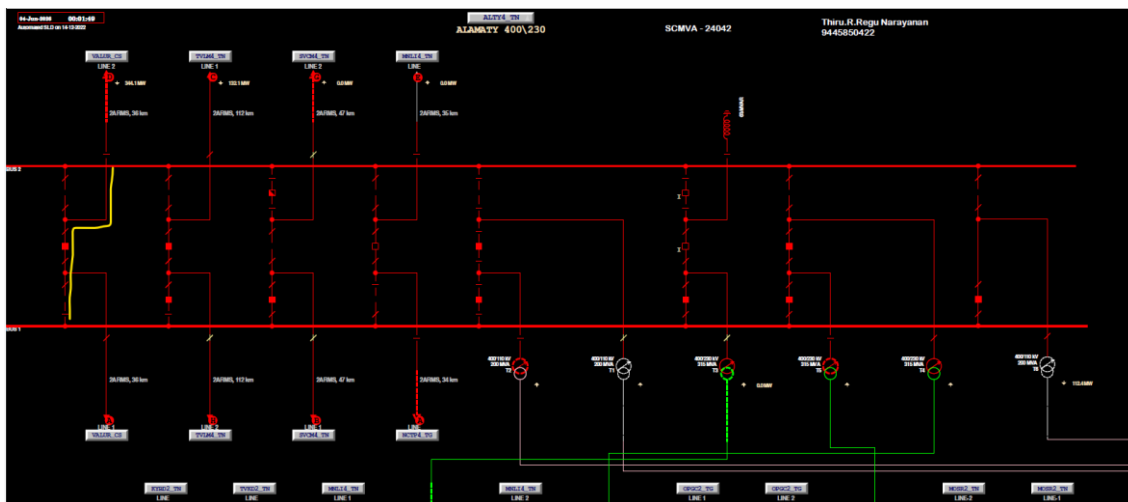
At 18:03hrs:

At 18:03hrs, during rain Y-G fault was observed in 400kV Alamathy NCTPS_STAGE_II-1. At both ends, the fault was sensed in zone-1 and Y-pole opened. However, though A/R close signal is seen, A/R did not operate at both ends and line tripped on PD.

At 18:30hrs:

During the Bus-2 BBP operation, the 400 kV Alamathy Vallur-2 main CB tripped and the feeder was subsequently charged through the tie CB, as the 400 kV Alamathy Vallur-1 line was in service through Bus-1 and both lines are in the same dia.

It was reported that a heavy arc was observed at the Bus-1 side isolator of the 400 kV Alamathy Vallur-1 line. Consequently, the main CB of the 400 kV Alamathy Vallur-1 line was manually tripped at 18:30 hrs, resulting in the tripping of both 400kV Alamathy Vallur-1 & 2.



SPS operation:

At Manali, Manali SPS has operated and a load relief of around 226MW was observed as the flow on 400kV Manali NCTPS was going around 740MW immediately after tripping of 400 kV Alamathy-Manali

Modeling:

Logic 1:

- To generate SPS trip signal in the event of tripping of any one of 400kV line(either 400kV Manali Alamathy or 400kV Manali NCTPS) after ensuring the loading on the available 400kV line exceeds 700MW and with a time delay of 5sec

Logic 2:

- To generate SPS trip signal instantaneously during simultaneous tripping of both 400kV lines (400kV Manali Alamathy and 400kV Manali NCTPS)

11. DR Analysis:

400KV-ALAMATHY-MANALI-1

	ALAMATHY - 400KV	MANALI - 400KV
Time Sync Issue	No	No

DR Analysis		
-------------	--	--

400KV-ALAMATHY-NCTPS_STAGE_II-1

	ALAMATHY - 400KV	NCTPS_STAGE_II - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:03-06-2026 18:03:15.529 POWER SWING OUTER GND DIST Z3 PKP, DEF BLK On TRIPBUS 5 OP, TRIP PHASE B, GND DIST Z1 OP, GND DIST Z2 PKP, PUTT TX1, POWER SWING INNER, TRIP 1-POLE AR RIP PUTT RECD On AR FORCE 3P TRIP 1252 B CLOSE Off AR 1-P RIP 1252 B CLOSE On 1252 B CLOSE Off AR CLOSE BKR1 AR LO TRIPBUS 5 OP 1252 A CLOSE Off, 1252 C CLOSE Off Ir (max): 1.01 kA Iy (max): 31.01 kA Ib (max): 2.37 kA Vr (max): 249.85 kV Vy (max): 233.52 kV Vb (max): 250.04 kV	DR Trigger Time:03-06-2026 18:03:15.518 Any Start I>4 Start DIST Fwd Any Trip, DIST Trip B, Z1 L10_CAR RECV CH2 L2_MCB B-PH OPEN Ir (max): 1.02 kA Iy (max): 8.94 kA Ib (max): 2.41 kA Vr (max): 233.74 kV Vy (max): 233.73 kV Vb (max): 234.61 kV DR Trigger Time:03-06-2026 18:03:15.521 Started Phase B I>4 Start Zone 1 B Trip, Zone 1 N Trip, Any Trip L13 CAR RECV CH1 Aid 1 Dist Trip L2 MCB Bph OPEN Started Phase C, I>4 Start Ir (max): 1.01 kA Iy (max): 8.93 kA Ib (max): 2.41 kA Vr (max): 233.94 kV Vy (max): 233.86 kV Vb (max): 234.70 kV

400KV-VALLUR-ALAMATHY-2

	ALAMATHY - 400KV	VALLUR - 400KV
Time Sync Issue	No	No
DR Analysis	Loss of busbar	Loss of busbar

400KV/230KV ALAMATHY-ICT-4

	ALAMATHY - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:03-06-2026 18:00:11.997 DI3 HV MCB OPEN Ir (max): 2.02 kA Iy (max): 0.31 kA Ib (max): 0.54 kA

400KV-VALLUR-ALAMATHY-1

	ALAMATHY - 400KV	VALLUR - 400KV
Time Sync Issue	No	No
DR Analysis	Hand tripped at Alamathy end	Hand tripped at Alamathy end

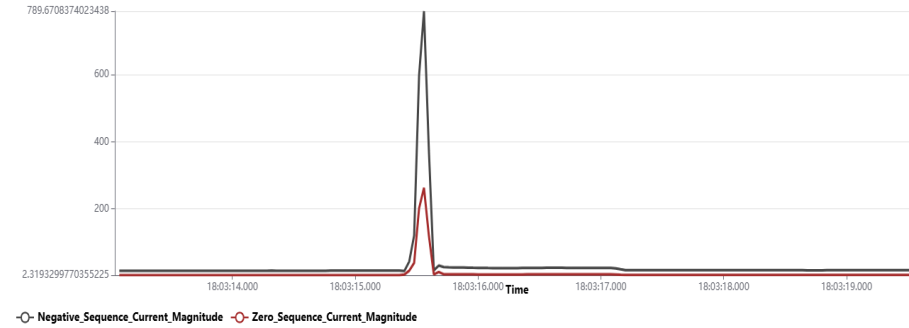
ALAMATHY - 400KV

	ALAMATHY - 400KV
Time Sync Issue	No
DR Analysis	Loss of busbar

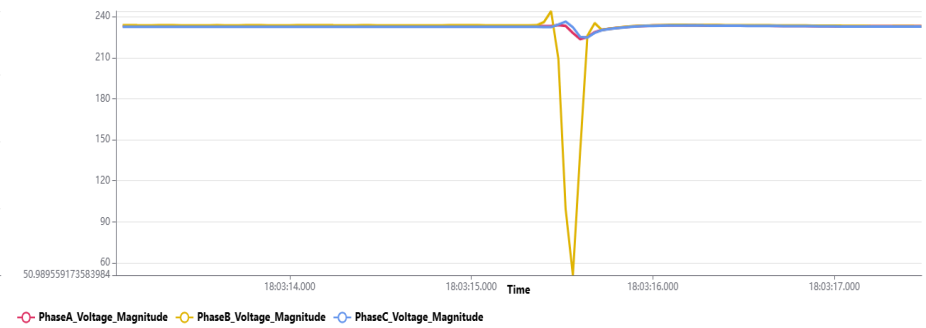
12. A) PMU Analysis:

GDs and GIs discussed during 144th PCSC meeting held on 08.07.2026

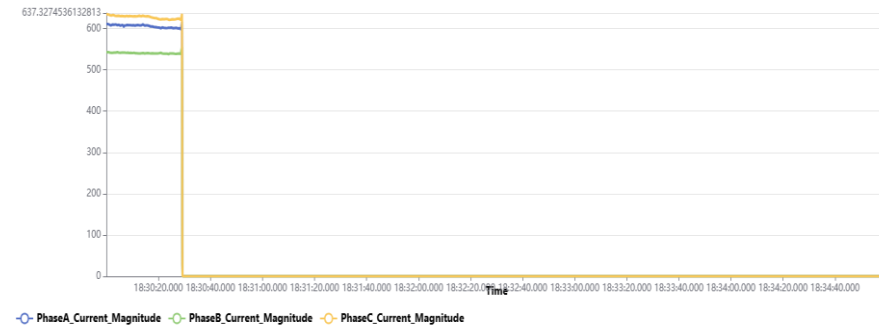
ALTY4_TN_400TVLM4_TN1_



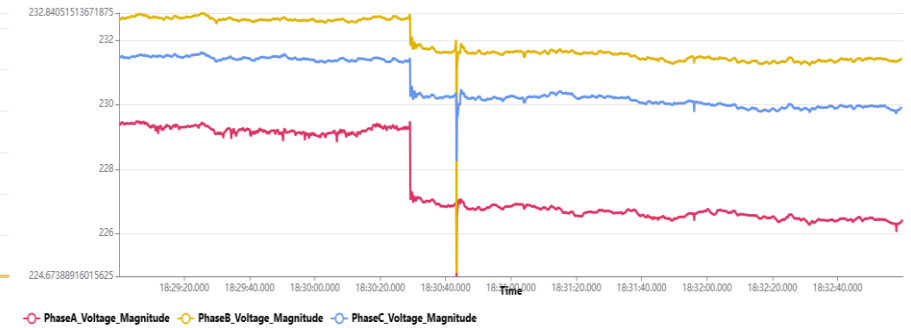
ALTY4_TN_400TVLM4_TN1_



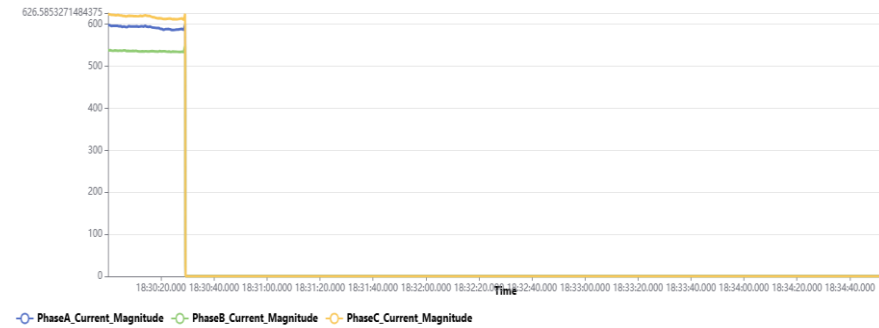
ALTY4_TN_400VALUR_CS1_



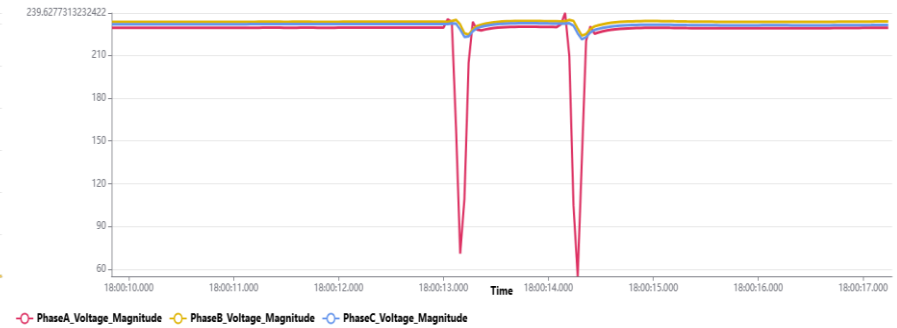
ALTY4_TN_400BUS2_

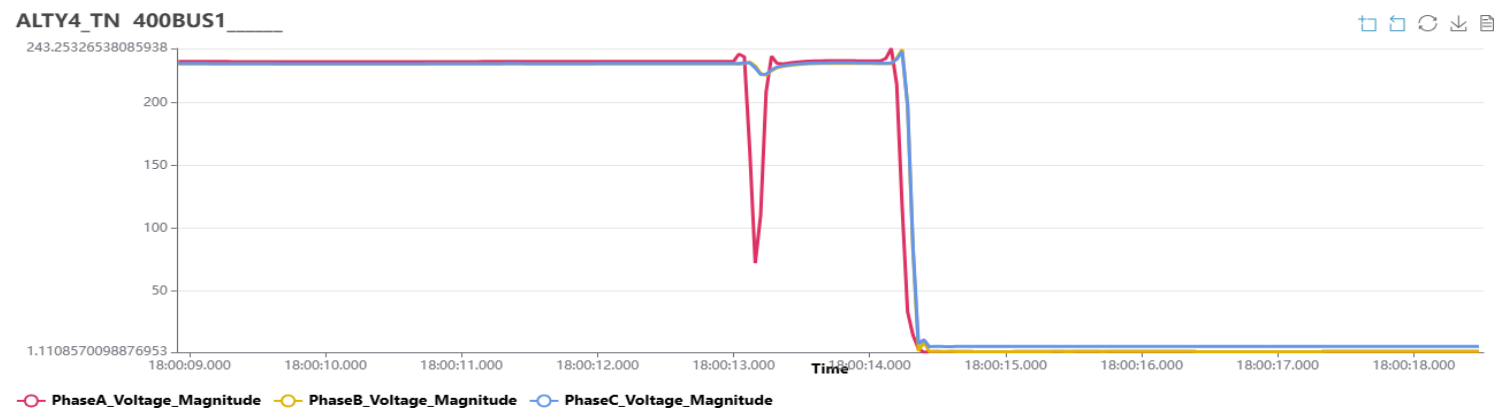


ALTY4_TN_400VALUR_CS2_



ALTY4_TN_400BUS2_





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

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

Constituent	Points for review
TANTRANSCO	1. Non operation of A/R at Manali end in 400kV Alamathi Manali line. 2. Non operatin of A/R on Alamathy end in 400KV-ALAMATHY-NCTPS_STAGE_II-1.

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

Constituent	Remedial Actions
TANTRANSCO	1. Test charged stood OK
NTECL	1. Hand tripped at Alamathy end

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

16. Restoration Details:

The 315 MVA, 400/230 kV ICT-4 was restored at 20:49 hrs on 03.06.2026. Subsequently, the 400 kV Alamathy–Manali Line was restored at 02:41 hrs on

04.06.2026. The 400 kV Alamathy–Sunguvarchatram-2 Line was restored at 13:20 hrs on 04.06.2026.

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

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

Annexure 1

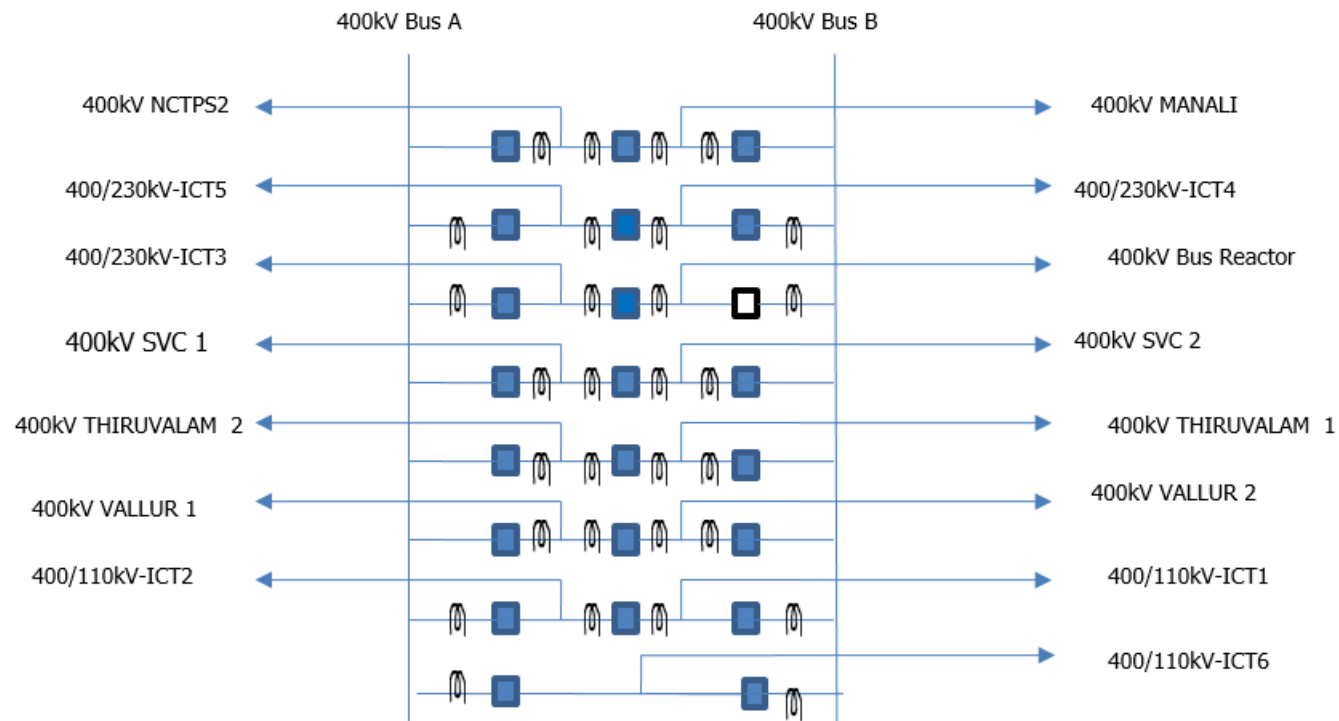
Sequence of Events as per SCADA

time	Event	Location
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 04 - CB 40452 OPEN	ALTY4_TN
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 07 - CB 40752 BETWEEN	ALTY4_TN
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 19 - CB 41952 OPEN	ALTY4_TN
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 22 - CB 42252 OPEN	ALTY4_TN
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 13 - CB 41352 OPEN	ALTY4_TN
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 01 - CB 40152 OPEN	ALTY4_TN
03-06-2026 18:00:19	ALAMATY 400\230 CB TIE 11 - CB 41152 INVALID	ALTY4_TN
03-06-2026 18:00:21	MANALI_400 CB TIE 05 - CB 40552 OPEN	MNLI4_TN
03-06-2026 18:00:21	MANALI_400 CB TIE 04 - CB 40452 OPEN	MNLI4_TN

Deliberations:

1. TANTRANSCO stated that in the antecedent conditions weather conditions are rainy and all elements are in service.

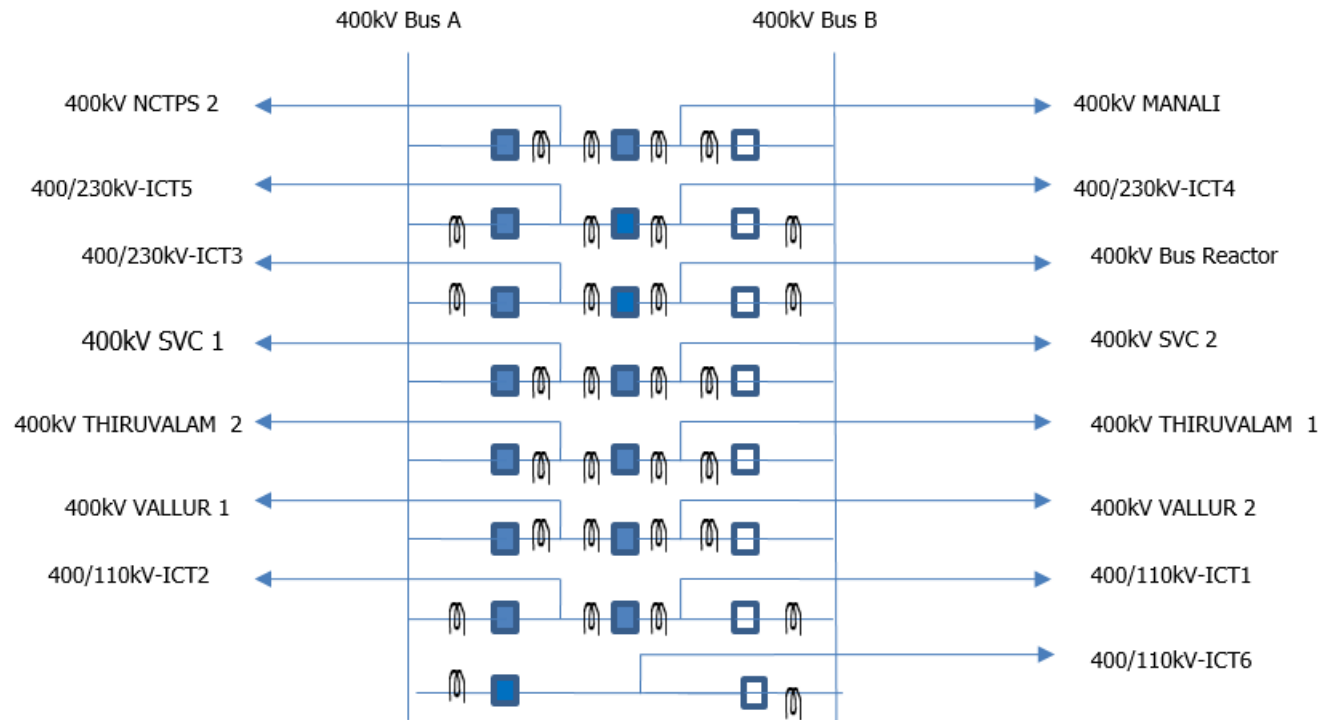
ANTCEDENT CONDITION



2. TANTRANSCO stated that on 03-06-2026 at 18:00 hrs 400kV Manali- Alamathy line fault tripped with Zone.1, R-N indication & TOR operated.



3. TANTRANSCO informed that on 03-06-2026 at 18:01 hrs Subsequent fault trip 400kV Manali_Alamathy line high Impedance BBP-2 operated. Heavy rain & lightning was reported. During inspection of yard , no visible fault noticed. 400 kV Bus Bar protection operated may be due to transient fault.. All elements were in service through Tie breaker. ICT 6 was in service through main breaker of Bus.A.



4. **Remedial action taken:** Yard condition checked and NO visible fault Noticed. 400kV Bus-B test charged through 400kV Thiruvallam.1 on 03-06-2026 at 19:07 hrs & stood OK. Numerical BBP relay allotted, Configuration completed & Cable laying pending addressed to System operation wing.
5. SRPC enquired about the reason for BBP operation and nature of fault. TANTRANSO stated that they are suspecting BBP maloperation. SRPC requested to replace static BBP relay with Numerical relay. TANTRANSO stated that new BBP relay is allotted and will install it during LC.

Recommendations:

TANTRANSO to replace the static BBP relay with Numerical BBP.

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 400kV Bus-1 of 400kV SEPC Generating station.	As per the reports submitted, the triggering incident was B-G fault in 400kV SEPC Bus-1. Immediately, 400kV Bus-1 BBP operated and all elements connected to the bus tripped.	06-06-2026 18:58	0	0	GI-2	06-07-2026	06-07-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During antecedent conditions, 00KV-OTTAPIDARAM-SEPC-1 was under shutdown. As per the reports submitted, the triggering incident was B-G fault in 400kV SEPC Bus-2. Immediately, 400kV Bus-2 BBP operated and all elements connected to the bus tripped including 400KV-OTTAPIDARAM-SEPC-2. Tripping of the only connected line led to complete outage of 400kV SEPC Generating station.

2. Time and Date of the Event (घटना का समय और दिनांक): 06-06-2026 18:58

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)	19374	19350
TamilNadu State Generation (MW)	7222	7225
Grid Frequency (Hz)	50.05	50.09
SR Demand (MW)	53374	53363
SR Generation (MW)	47847	47828

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

SEPC Bus-2. Immediately, 400kV Bus-2 BBP operated and all elements connected to 400kV Bus-2 tripped including 400KV-OTTAPIDARAM-SEPC-2. At OTTAPIDARAM end, the fault was detected in Z1 and initially B-pole trip was initiated and AR started but after 80ms 3-phase trip was initiated with AR lockout and the line was tripped. Tripping of the only connected line led to complete outage of 400kV SEPC Generating station.

11. DR Analysis:

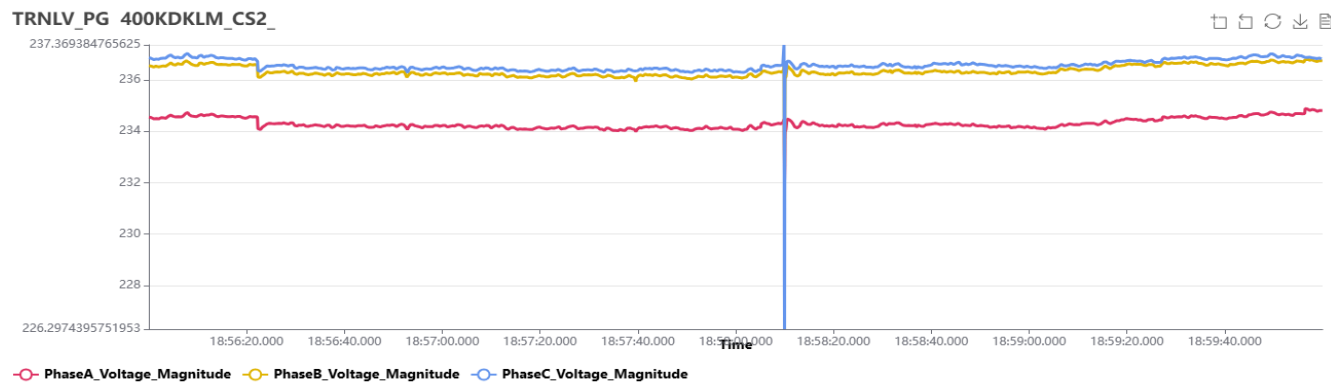
400KV-OTTAPIDARAM-SEPC-2

	SEPC - 400KV	OTTAPIDARAM - 400KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:06-06-2026 18:58:09.785 Fault Check Zone Fault Phase C, Flt 87BB Zone 2, Trip 87BB Zone 2 Ir (max): 0.04 kA Iy (max): 0.02 kA Ib (max): 9.31 kA	DR Trigger Time:06-06-2026 18:58:09.973 ANY START, ZONE-2/3/4 START Any Trip, CB1 Trip OutputC, CB2 Trip OutputC, ZONE1 START, Zone 1 Trip, Aided 1 Send AR Start, ARIP, AR Blocked DI13 21M1X B OP DI03 MCB B OPEN DI09 CAR1&2 FAIL CB1 AR Lockout CB1 Trip OutputA, CB1 Trip OutputB, CB1 Trip 3ph AR Start DI02 MCB Y OPEN DI01 MCB R OPEN Ir (max): 0.05 kA Iy (max): 0.05 kA Ib (max): 9.25 kA Vr (max): 280.87 kV Vy (max): 241.74 kV Vb (max): 246.60 kV

SEPC - 400KV

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

12. A) PMU Analysis:



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

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

Constituent	Points for review
	Reason for fault at SEPC end.
TANTRANSCO	1. Zone-1 over reach at Ottapidaram end. 2. Non operation of A/R at Ottapidaram end.

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

Constituent	Remedial Actions
-------------	------------------

	The 406-89B (Q22) Bus Reactor was isolated due to a flashover involving Q22 (Isolator) and Q34 (Earth Switch). The Bus Reactor remains in the OFF condition. Bus-2 was isolated following the flashover. Line-2 and Bus-1 Charged on 06-06-26(21:09:57 Hrs) Bus-2 was re-energized on 09-06-2026 at 00:37 hrs by closing the Bus Coupler. The Bus Reactor could not be restored to service due to problem in Q22 (Isolator) and Q34 (Earth Switch) caused by the flashover.
--	---

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

16. Restoration Details:

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
06-06-2026 18:58:18	SEPC TUTICORIN CB COUPLER CB 40352 OPEN	SEPC4_TG
06-06-2026 18:58:18	SEPC TUTICORIN CB 40552 (LINE-2 TO OTPM4) OPEN	SEPC4_TG
06-06-2026 18:58:48	OTTAPIDARAM 400 CB TIE 10 - CB 41052 INVALID	OTPM4_TN
06-06-2026 18:59:07	OTTAPIDARAM 400 CB TIE 10 - CB 41052 OPEN	OTPM4_TN

Deliberations:

There was no response from SEPC during the agenda item discussion.

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 Kalpakka Bus-3 of APTRANSCO	The triggering incident is the 4" IPS pipe connector failure in 400 kV Bay-424 (PGCIL-2 Bay) and came into contact with R-phase, resulting in R-G Bus fault in Bus-3. Subsequently, Bus-3 Busbar Protection operated and tripped all Bus-3 connected elements, namely 400kV Simhadri-Kalpakka-2, 400kV Kalpakka-Vemagiri AP-1, 400kV Gazuwaka-Kalpakka-2 and 400/220kV ICT-3 and Direct Transfer Trip signals were also transmitted to the corresponding remote substations. This led to the Tripping of 400kV Kalpakka Bus-3 of APTRANSCO	09-06-2026 19:26	0	0	GI-2	15-06-2026	11-06-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

The triggering incident is the 4" IPS pipe connector failure in 400 kV Bay-424 (PGCIL-2 Bay) and came into contact with R-phase, resulting in R-G Bus fault in Bus-3. Subsequently, Bus-3 Busbar Protection operated and tripped all Bus-3 connected elements, namely 400kV Simhadri-Kalpakka-2, 400kV Kalpakka-Vemagiri AP-1, 400kV Gazuwaka-Kalpakka-2 and 400/220kV ICT-3 and Direct Transfer Trip signals were also transmitted to the corresponding remote substations. This led to the Tripping of 400kV Kalpakka Bus-3 of APTRANSCO

2. Time and Date of the Event (घटना का समय और दिनांक): 09-06-2026 19:26

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

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)	10371	10218
Andhra Pradesh State Generation (MW)	8163	8175
Grid Frequency (Hz)	50.08	50.08
SR Demand (MW)	53984	53821
SR Generation (MW)	52107	51980

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

Elements under outage	1. 400KV-KALPAKKA-ASUPAKA-1 2. 400KV-KALPAKKA-KHAMMAM_PG-2
Weather Condition (मौसम स्थिति)	Normal

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-HINDUJA-KALPAKKA-1 2. 400KV-SIMHADRI-KALPAKKA-3 3. 400KV-MARADAM-KALPAKKA-1 4. 400KV/220KV KALPAKKA-ICT-2	1. 400KV-HINDUJA-KALPAKKA-2 2. 400KV-SIMHADRI-KALPAKKA-4 3. 400KV-MARADAM-KALPAKKA-2 4. 400KV/220KV KALPAKKA-ICT-1
Bus 3 Connected Elements	Bus 4 Connected Elements
1. 400KV/220KV KALPAKKA-ICT-3 2. 400KV-SIMHADRI-KALPAKKA-2 3. 400KV-KALPAKKA-VEMAGIRI_AP-1 4. 400KV-GAZUWAKA-KALPAKKA-2	1. 400KV-GAZUWAKA-KALPAKKA-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, 56 minutes

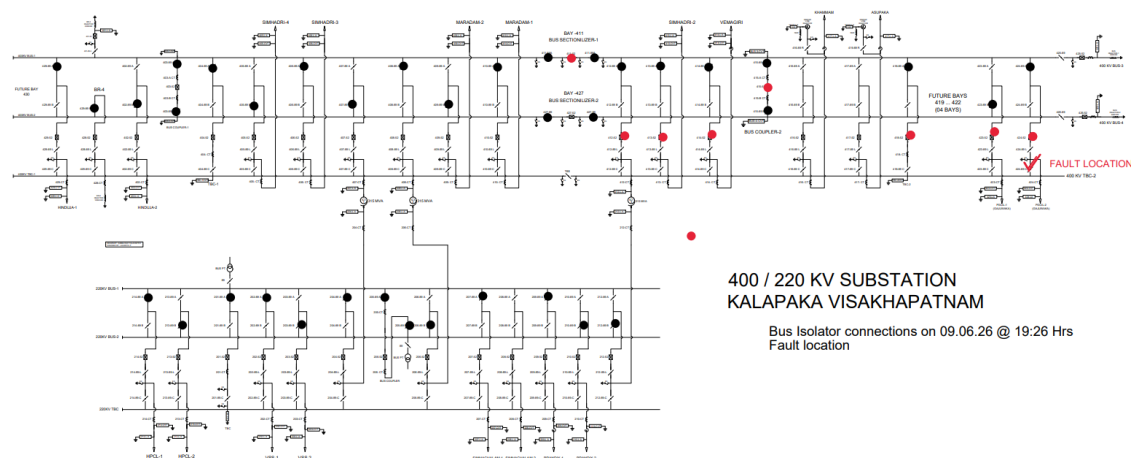
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 400KV-SIMHADRI-KALPAKKA-2
2. 400KV-KALPAKKA-VEMAGIRI_AP-1
3. 400KV-GAZUWAKA-KALPAKKA-2
4. 400KV/220KV KALPAKKA-ICT-3

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

The triggering incident is the 4" IPS pipe connector located in the R-phase section between the Line Isolator and TBC Isolator failure and became disconnected from its support in 400 kV Bay-424 and came in contact with R-phase equipment creating a R-G Bus fault within the Bus-3 protection zone as shown below.



Hence, Bus-3 BBP Protection operated and tripped all Bus-3 connected elements, namely 400 kV Simhadri–Kalpakka-2, 400 kV Kalpakka–Vemagiri AP-1, 400 kV Gazuwaka–Kalpakka-2 and 400/220 kV Kalpakka ICT-3 and DT was sent to remote ends (for lines) and remote ends tripped. This led to the Tripping of 400kV Kalpakka Bus-3 of APTRANSCO.

11. DR Analysis:

400KV-SIMHADRI-KALPAKKA-2

	SIMHADRI - 400KV	KALPAKKA - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:09-06-2026 19:26:27.681 IOC ALARM	DR Trigger Time:09-06-2026 19:26:27.681 Trip L1 CZ

	ZONE-3 START any start DEF START ZONE-2 START CARRIER SEND DT RCVD CH1 GENERAL TRIP, 3ph trip, TRIP_RPH, TRIP_YPH, TRIP_BPH, AR BLOCK mcb, TCB AR INHBI, MCB AR INHIBI DT RECI CH2 86A OPTD, 86A OPTD 86B OPTD PR3P MCB AR, PRE3PH TCB AR AR INHB FB M1 Ir (max): 7.24 kA Iy (max): 1.61 kA Ib (max): 0.50 kA Vr (max): 236.30 kV Vy (max): 238.70 kV Vb (max): 256.01 kV DR Trigger Time:09-06-2026 19:26:27.735 IOC ALARM ZONE-3 START any start DEF START ZONE-2 START CARRIER SEND DT RCVD CH1 GENERAL TRIP, 3ph trip, TRIP_RPH, TRIP_YPH, TRIP_BPH, AR BLOCK mcb, TCB AR INHBI, MCB AR INHIBI DT RECI CH2 86A OPTD, 86A OPTD 86B OPTD PR3P MCB AR, PRE3PH TCB AR AR INHB FB M1	Device trip G, Trip L1 G, Trip BBP G, Trip BUS3 G
--	--	---

	Ir (max): 7.24 kA Iy (max): 1.61 kA Ib (max): 0.50 kA Vr (max): 236.30 kV Vy (max): 238.71 kV Vb (max): 256.01 kV	
--	--	--

400KV-KALPAKKA-VEMAGIRI_AP-1

	KALPAKKA - 400KV	VEMAGIRI_AP - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:09-06-2026 19:26:27.681 Trip L1 CZ Device trip G, Trip L1 G, Trip BBP G, Trip BUS3 G	DR Trigger Time:09-06-2026 19:26:27.743 DIST ND ST L1 STARTZ3, STARTZ4 DT RECV CH1 DT RECVD 3PH GR-A OPTD 3PH GR-B OPTD DT RECV CH2 LBB INITIATIO AR BLOCK(DR) Ir (max): 1.90 kA Iy (max): 0.87 kA Ib (max): 0.39 kA Vr (max): 253.87 kV Vy (max): 256.06 kV Vb (max): 259.04 kV

KALPAKKA - 400KV

	KALPAKKA - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:09-06-2026 19:26:27.681 Trip L1 CZ Device trip G, Trip L1 G, Trip BBP G, Trip BUS3 G

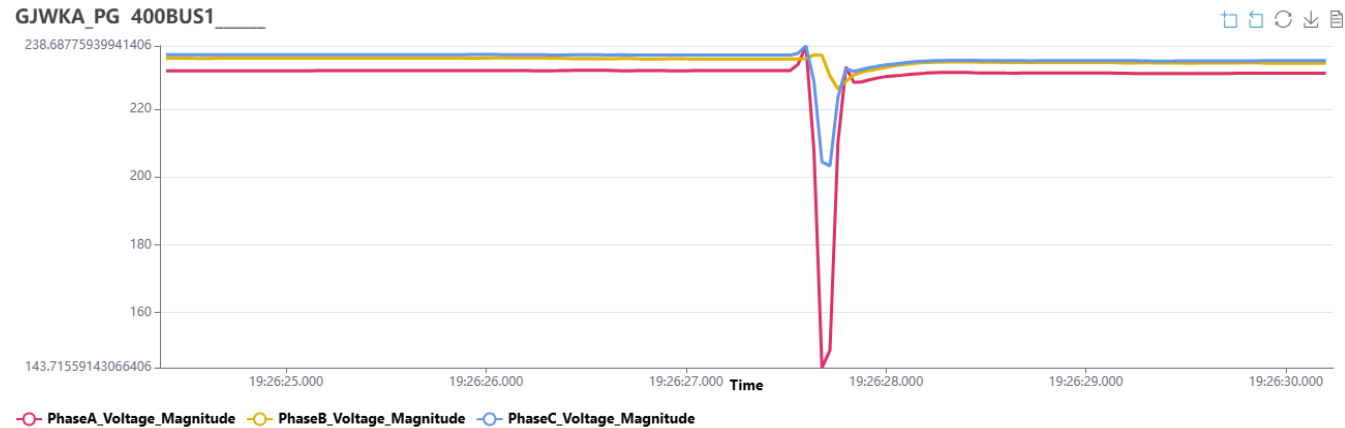
400KV/220KV KALPAKKA-ICT-3

	KALPAKKA - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:09-06-2026 19:26:27.681 Trip L1 CZ Device trip G, Trip L1 G, Trip BBP G, Trip BUS3 G

400KV-GAZUWAKA-KALPAKKA-2

	GAZUWAKA - 400KV	KALPAKKA - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:09-06-2026 19:26:27.713 DT_REC_CH1/2 GR_A/B_OPTD T_CB_BO T_CB_YO M_CB_RO, M_CB_YO M_CB_BO CB_PD_OPTD T_CB_RO Ir (max): 0.01 kA Iy (max): 1.20 kA Ib (max): 0.84 kA Vr (max): 234.60 kV Vy (max): 238.34 kV Vb (max): 261.50 kV	DR Trigger Time:09-06-2026 19:26:27.681 Trip L1 CZ Device trip G, Trip L1 G, Trip BBP G, Trip BUS3 G

12. A) PMU Analysis:



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

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

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

Constituent	Remedial Actions
APTRANSCO	1. Restoration work attending by O&M wing Kalpakka

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

16. Restoration Details:

400KV-SIMHADRI-KALPAKKA-2 charged on 09.06.2026 at 21:21Hrs.

400KV-KALPAKKA-VEMAGIRI_AP-1 charged on 10.06.2026 at 06:41 Hrs

400KV/220KV KALPAKKA-ICT-3 charged on 10.06.2026 at 13:25Hrs

400KV-GAZUWAKA-KALPAKKA-2 charged on 10.06.2026 at 20:01Hrs

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)	
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
09-06-2026 19:26:31	KALAPAKA CB COUPLER CB 41152 OPEN	KLPK4_AT
09-06-2026 19:26:31	KALAPAKA CB 41452 (LINE TO VMGR4) OPEN	KLPK4_AT
09-06-2026 19:26:31	KALAPAKA CB COUPLER CB 41552 OPEN	KLPK4_AT
09-06-2026 19:26:31	KALAPAKA CB 41352 (LINE-2 TO SMDR2) OPEN	KLPK4_AT
09-06-2026 19:26:31	KALAPAKA CB 41252 (T3_P) OPEN	KLPK4_AT
09-06-2026 19:26:31	KALAPAKA CB 42452 (LINE-2 TO GJWKA) OPEN	KLPK4_AT
09-06-2026 19:26:31	KALAPAKA CB 21252 (T3_S) OPEN	KLPK4_AT
09-06-2026 19:26:38	GAZUWAKA CB TIE 10 - CB 41052 BETWEEN	GJWKA_PG
09-06-2026 19:26:57	KALAPAKA CB 42352 (LINE-1 TO GJWKA) OPEN	KLPK4_AT

Deliberations:

1. APTRANSCO stated that in the Antecedent Network Configuration. The elements connected to the 400 kV buses prior to the incident were as follows:

400 kV Bus-1	400 kV Bus-2	400 kV Bus-3	400 kV Bus-4
HNPCL-1	HNPCL-2	Vemagiri	
Gazuwaka-1		Gazuwaka-2	
Maradam-1	Maradam-2		
315 MVA ICT-2	315 MVA ICT-1	315 MVA ICT-3	
TBC-2	STPP-3	STPP-4	STPP-2

2. **Bus Configuration:** Bus Coupler-1 and Bus Coupler-2 were in the **closed** position. Bus Sectionalizer-1 and Bus Sectionalizer-2 were in the **closed** position. The 400 kV Khammam and 400 kV Asupaka feeders were under Line Clearance (LC) at the time of the incident.
3. APTRANSCO stated that the trigerring incident occurred at 19:26:27:678 Hrs, R-Ph fault started in 400kV Bus-3 of Kalapaka due to disconnection of 4" Aluminium pipe between BPI to Transfer bus isolator in 400kV Gazuwaka (PG) - 2 feeder bay in 400kV SS, Kalapaka due to melting of clamp.
4. APTRANSCO stated that for the above fault, 400kV Bus-3 Bus bar protection was operated and trip was extended to CBs all the connected elements (i.e. Gazuwaka-2, STPP-2, Vemagiri, 400/220kV, 315MVA ICT-3, Bus coupler-2 and Bus sectionalizer)
5. After 24.4 mSec from the inception of the above fault, R-Y fault started in 400kV Kalapaka-Gazuwaka line-1, that was connected to 400kV Bus-4 (R-ph conductor snapped between location no. 2 and 3). For this fault, Line differential protection operated and tripped the CB.
6. **Remedial Measures Taken:**
- Replaced damaged R-Ph HCB isolator rigid clamp & flexible clamp in Gazuwaka-1 feeder bay and special patrolling conducted and found R-Ph conductor snapped in between loc no.2 to 3 and rectification work were completed.
 - Replaced damaged B-Ph Bus-2 isolator male contact, isolator stacks, pipe in 315MVA ICT-3 bay.
 - Replaced damaged R-ph C isolator L-clamp & U-clamp in Gazuwaka-2 feeder bay.
7. SRPC highlighted the frequent tripping in Kalpakka SS and requested APTRANSCO to ensure proper periodic maintainance to be carried out. APTRANSCO agreed to the same.

Recommendation:

 **APTRANSCO to conduct regular periodic maintainance activities in Kalpakka SS.**
