

Grid Occurrences – 142

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 Zenataris	As per the reports submitted, the triggering incident was DC supply failure at 220kV Zenataris leading to the tripping of 220kV Hiriur Zenataris line. Tripping of the only connected line led to complete outage of 220kV Zenataris.	16-03-2026 14:40	0	0	GD - 1	13-04-2026	-	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 DC supply failure at 220kV Zenataris leading to the tripping of 220kV Hiriur Zenataris line. Tripping of the only connected line led to complete outage of 220kV Zenataris.

2. Time and Date of the Event (घटना का समय और दिनांक: 16-03-2026 14:40)

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)	17879	17847
Karnataka State Generation (MW)	10936	10778
Grid Frequency (Hz)	49.94	49.98
SR Demand (MW)	69145	69216
SR Generation (MW)	54371	54219

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

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

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

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

7. Duration of interruption (रुकावट की अवधि): 2 hours, 1 minutes

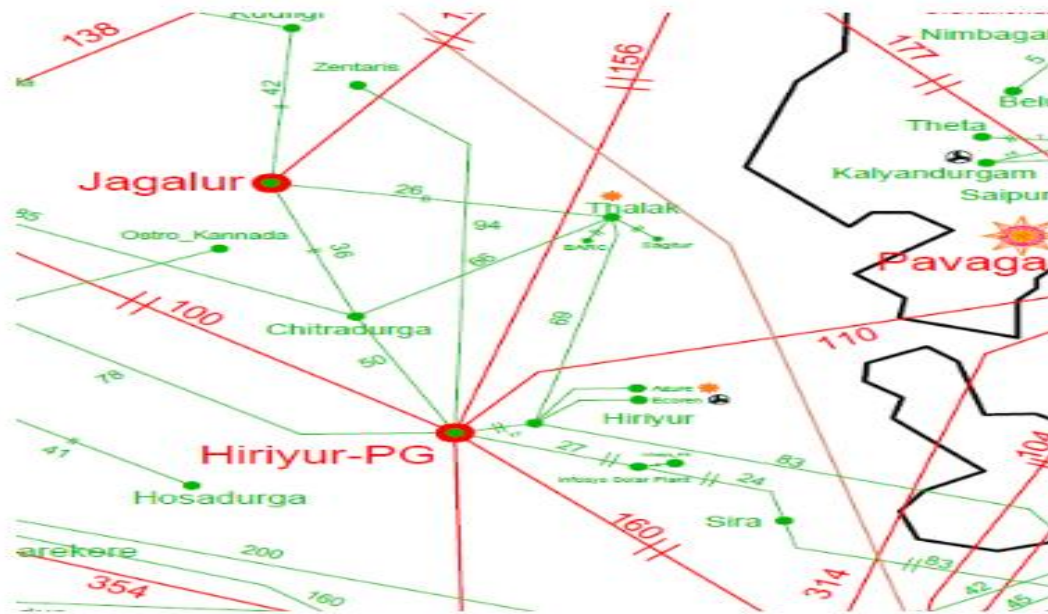
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. ZENATARIS_PSS - 220KV

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

As per the reports submitted, at Zenataris SS, Phase-2 commissioning internal testing is presently underway, and the DC supply was accidentally switched off due to human error, which led to the tripping of the circuit breaker of the 220 kV Hiriyur–Zenataris Line-1 at the Zenataris end only. The line was holding at the Hiriyur end. The tripping of the only connected line resulted in a complete outage of the 220 kV Hiriyur–Zenataris Line-1.



11. DR Analysis:

220KV-HIRIYUR-ZENATARIS_PSS-1

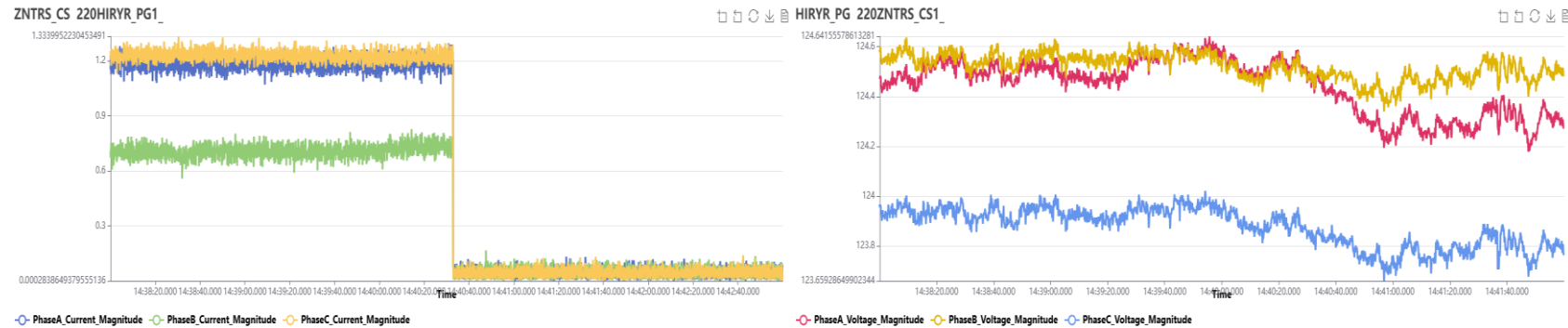
	ZENATARIS_PSS - 220KV	HIRIYUR - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:16-03-2026 14:40:32.939 MAIN CB R OPEN, MAIN CB B OPEN MAIN CB Y OPEN CB OPEN AR PREP 3PH Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 125.51 kV Vy (max): 125.49 kV Vb (max): 124.91 kV	Line was holding at Hiriur end

	DR Trigger Time:16-03-2026 14:40:32.939 MAIN CB R OPEN, MAIN CB B OPEN MAIN CB Y OPEN CB OPEN AR PREP 3PH Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 125.51 kV Vy (max): 125.49 kV Vb (max): 124.91 kV	
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ZENATARIS_PSS - 220KV

	ZENATARIS_PSS - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:16-03-2026 14:40:32.939 MAIN CB R OPEN, MAIN CB B OPEN MAIN CB Y OPEN CB OPEN AR PREP 3PH Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 125.51 kV Vy (max): 125.49 kV Vb (max): 124.91 kV DR Trigger Time:16-03-2026 14:40:32.939 MAIN CB R OPEN, MAIN CB B OPEN MAIN CB Y OPEN CB OPEN AR PREP 3PH Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 125.51 kV Vy (max): 125.49 kV Vb (max): 124.91 kV

12. A) PMU Analysis:



From the PMU, no fault is observed during the event

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

Constituent	Points for review
HIRIYUR_ZREPL	<ol style="list-style-type: none"> 1. SOP to be followed during testing activities. 2. Reason for hand tripping of both DC supply sources at Zenataris end.

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

Constituent	Remedial Actions
HIRIYUR_ZREPL	DC distribution area to be prohibited

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

16. Restoration Details:

220KV-HIRIYUR-ZENATARIS_PSS-1 tripped at 16-03-2026 14:40 and restored at 16-03-2026 15:42

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)	HIRIYUR_ZREPL
4	Any other non-compliance	IEGC section 17.3	

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

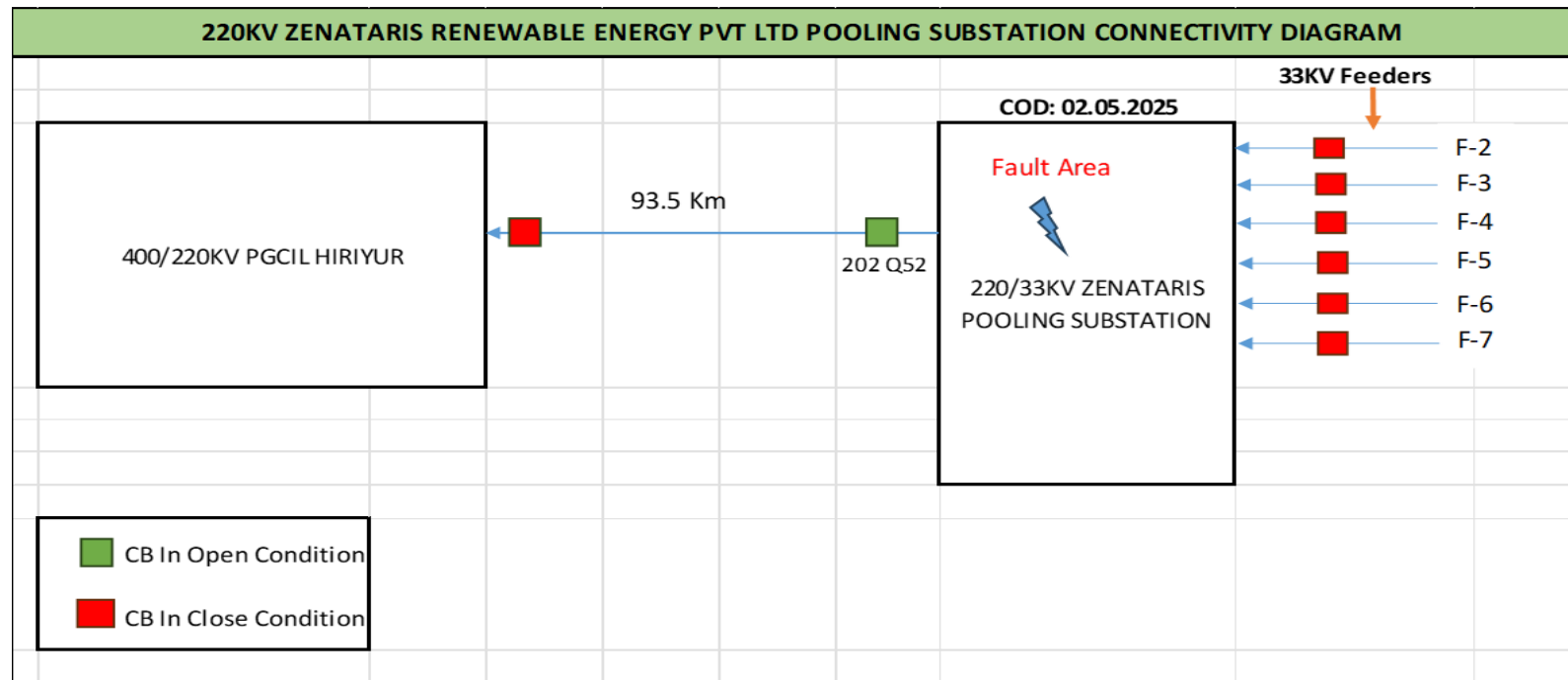
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
16-03-2026 14:40:46	ZENTARIS CB 30252 (LOAD-2 WND) OPEN	ZNTRS_CS
16-03-2026 14:40:46	ZENTARIS CB 20252 (LINE TO HIRYR) OPEN	ZNTRS_CS
16-03-2026 14:40:46	ZENTARIS CB 30452 (LOAD-4 WND) OPEN	ZNTRS_CS
16-03-2026 14:41:28	ZENTARIS CB 30152 (LOAD-1 WND) OPEN	ZNTRS_CS
16-03-2026 14:41:38	HIRIYUR CB TIE 10 - CB 41052 BETWEEN	HIRYR_PG
16-03-2026 14:41:40	HIRIYUR CB TIE 10 - CB 41052 OPEN	HIRYR_PG

Deliberations:

1. M/s Zentarius stated that, under antecedent conditions, internal testing activities related to Phase-II commissioning were in progress.



2. M/s Zentarius informed that on 16.03.2026 at 14:40 hrs, the 220 kV line breaker tripped due to DC supply failure at Zentarius end. Upon detailed analysis, it was observed that the incident occurred during Phase-II relay testing and signal testing activities being carried out by the project team. During the testing process, both DC sources of the 220 kV line panel were inadvertently switched off instead of the intended panels, resulting in the tripping.
3. As a remedial measure, M/s Zentarius stated that all charged panels had been locked to prevent unauthorised access.
4. SRPC enquired whether CTD was enabled for the lines. M/s Zentarius confirmed that CTD had been enabled for the lines. SRLDC suggested that CTD for lines shall be disabled and enabled only for ICTs, in line with the deliberations and decisions of the earlier PCSC meetings.
5. SRPC instructed M/s Zentarius to ensure strict adherence to SOPs during testing and maintenance activities to avoid recurrence of such incidents.

Recommendations:

- ✚ M/s Zenatrius to disable CTD for lines.
- ✚ M/s Zentarius to strictly adhere to SOP during testing activites.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
2	Complete Outage of 220kV TP SAURYA of TATA POWER	220 kV TP SAURYA is connected radially to KOPPAL through 220 kV-TP SAURYA LIMITED-KOPPAL-1. The triggering incident is the B-G fault in the 220KV-TP SAURYA LIMITED-KOPPAL-1 line and tripping of the only line connected to 220kV TP SAURYA led to the Complete Outage of 220 kV TP SAURYA of TATA POWER	17-03-2026 19:35	0	0	GD - 1	28-03-2026	21-03-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV TP SAURYA is connected radially to KOPPAL through 220KV-TP SAURYA LIMITED-KOPPAL-1. The triggering incident is the B-G fault in the 220KV-TP SAURYA LIMITED-KOPPAL-1 line and tripping of the only line connected to 220kV TP SAURYA led to the Complete Outage of 220kV TP SAURYA of TATA POWER

2. Time and Date of the Event (घटना का समय और दिनांक: 17-03-2026 19:35)

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)	10783	10745
Karnataka State Generation (MW)	6261	6263
Grid Frequency (Hz)	50.0	50.0
SR Demand (MW)	52977	52894
SR Generation (MW)	51252	51238

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

Elements under outage	1. 220KV-TP SAURYA LIMITED-KOPPAL-1 2. TP SAURYA LIMITED - 220KV
Weather Condition (मौसम स्थिति)	Rainy , Thunders , Windy

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

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

7. Duration of interruption (रुकावट की अवधि): 3 hours, 45 minutes

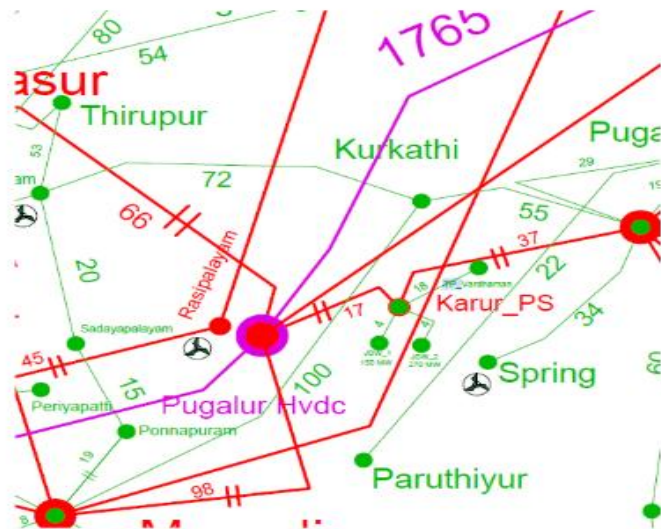
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-TP SAURYA LIMITED-KOPPAL-1
2. TP SAURYA LIMITED - 220KV

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

220kV TP SAURYA is connected radially to KOPPAL through 220kV-TP SAURYA LIMITED-KOPPAL-1. The triggering incident is the B-G fault in the 220kV-TP SAURYA LIMITED-KOPPAL-1 line. It is reported that at TP Saurya end line tripped due to distance protection. However, the same could not be verified due to incomplete DR. At Koppal end, the fault behaviour could not be assessed due to non submission of FIR, DR, and EL. Tripping of the only line connected to 220kV TP SAURYA led to the Complete Outage of 220kV TP SAURYA of TATA POWER.



11. DR Analysis:

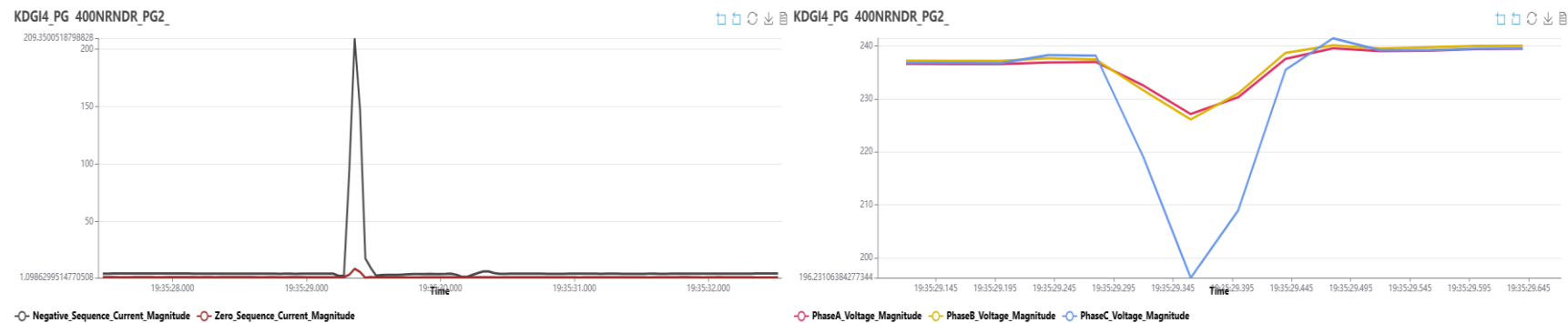
220KV-TP SAURYA LIMITED-KOPPAL-1

	TP SAURYA LIMITED - 220KV	KOPPAL - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:17-03-2026 19:35:33.372 CAR FL FROM DTPC Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 1.02 kV Vy (max): 0.72 kV Vb (max): 0.69 kV DR is incomplete	DR is not uploaded.

TP SAURYA LIMITED - 220KV

	TP SAURYA LIMITED - 220KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:17-03-2026 19:35:33.372 CAR FL FROM DTPC Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 1.02 kV Vy (max): 0.72 kV Vb (max): 0.69 kV DR is incomplete

12. A) PMU Analysis:



From the PMU plot, dip in B-phase voltage is observed indicating B-G fault during the event with no delayed fault clearance.

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

Constituent	Points for review
TATA	Non furnishing of complete DR at TP Saurya end
INDIGRID	Non furnishing of FIR, DR, EL at Koppal end

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

Constituent	Remedial Actions
TATA	Transmission line inspection done and no abnormalities are found

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

17/03/2026 23:20

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)	TATA
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	INDIGRID, TATA
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): Nil**Annexure 1****Sequence of Events as per SCADA**

time	Event	Location
17-03-2026 19:35:31	KOPPAL CB 20352 (LINE TO TPSRL) OPEN	KOPPL_PG

Detailed Draft Report of grid event submitted by TP SAURYA LIMITED SS:

Detailed Report

Date of Submission : 21-03-2026 12:31

TP SAURYA LIMITED - 220KV tripped at 17-03-2026 19:35 and
restored at 21-03-2026 23:20

Summary of Event (घटना का सारांश) : On dated 17.03.2026 at 19:35 Line bay 203 tripped on Line distance Protection, specifically B phase with a Fault current as 21kA and followingly TP SL Line Bay 204 tripped on Differential Protection.

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 19:35

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : TP SAURYA LIMITED - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. TP SAURYA LIMITED - 220KV	1. TP SAURYA LIMITED - 220KV - Bus 1	1. TP SAURYA LIMITED - 220KV - Bus 2	

Station Connectivity / SLD during antecedent : KNTL thalakai

Weather Conditions : Rainy, Thunders, Windy

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : True

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None

Auto Reclosure Operation : Yes

Fault Clearing Time (ms) : 0.0

Load and Generation Loss (लोड और जेनरेशन हानि) :

Solar Generation Loss (MW)	Wind Generation Loss (MW)	Other Generation Loss (MW)	Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW	0 MW	0 MW	0 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event): :

Equipment Type	Equipment Make
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List of elements tripped during the event : 1. 220KV-TP SAURYA LIMITED-KOPPAL-1
2. TP SAURYA LIMITED - 220KV

Station Connectivity/SLD during the event	:	KNTL thalakai
Analysis of the event	:	On dated 17.03.2026 at 19:35 Line bay 203 tripped on Line distance Protection, specifically B phase with a Fault current as 21kA and followingly TPSL Line Bay 204 tripped on Differential Protection.
Protection / Operational Issues observed	:	Differential Protection was operated and specifically mentioned as B phase
Restoration Details	:	The transmission line was inspected, and no abnormalities were found. During the tripping period, rain, thunder, and wind were present at the location.
DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	Transmission line inspection done and no abnormalities are found
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	nil
Main I Relay Indications	:	Differential trip and B phase fault alarms triggered
Main II Relay Indications	:	Differential trip
Other Relay Indications	:	EF Start
PLCC Counter Increment I/T	:	0
PLCC Counter Increment D/T	:	2
Fault Current Value (kAmp)	:	0.343
LA Counter	:	4
Remarks	:	
Attachments	:	

Deliberations:

1. This event was discussed in 141st PCSC Meeting under GD-7.
2. DR, EL & FIR to be furnished for Koppal by M/s Indigrid

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 400kV YTPS Generating Station of KPCL, 400kV Kalaburagi SS, 220 kV Aheri, Nimbarga, Vaishali, Shahbad, Kapnoor, Humnabad, Gulbarga, and Santhapur and tripping of 220 kV Bijapur Bus-2, Shahpur Bus-2, Sedam Bus-2 of KPTCL	400kV YTPS Generating Station, 400kV Kalaburagi SS, 220 kV Aheri, Nimbarga, Vaishali, Shahbad, Kapnoor, Humnabad, Gulbarga, and Santhapur ,220 kV Bijapur Bus-2, Shahpur Bus-2, Sedam Bus-2 are being radially connected through 400kV BPS YTPS Line-1&2. As per the reports submitted, 400kV BPS YTPS Line-1 tripped on R-G fault at 20:27hrs and 400kV BPS YTPS Line-2 tripped on RY fault at 22:26hrs. Tripping of both lines led to complete outage of all radial connected stations.	17-03-2026 21:52	975	232 MW	GD - 1	13-04-2026	20-03-2026 23-03-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:**1. Event Summary (घटना का सारांश):**

400kV YTPS Generating Station, 400kV Kalaburagi SS, 220 kV Aheri, Nimbarga, Vaishali, Shahbad, Kapnoor, Humnabad, Gulbarga, and Santhapur ,220 kV Bijapur Bus-2, Shahpur Bus-2, Sedam Bus-2 are being radially connected through 400kV BPS YTPS Line-1&2. As per the reports submitted, 400kV BPS YTPS Line-1 tripped on R-G fault at 20:27hrs and 400kV BPS YTPS Line-2 tripped on RY fault at 22:26hrs. Tripping of both lines led to complete outage of all radial connected stations.

2. Time and Date of the Event (घटना का समय और दिनांक: 17-03-2026 20:27

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)	10421	10481
Karnataka State Generation (MW)	6327	5413
Grid Frequency (Hz)	49.98	50.03
SR Demand (MW)	52137	52169
SR Generation (MW)	48720	48204

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

Elements under outage	1. 400KV-BPS-YTPS-1 2. 220KV-SEDAM-FEROZABAD-1 3. KAPNOOR - 220KV - Bus 1 4. KAPNOOR - 220KV - Bus 2 5. 220KV-HUMNABAD-HALBURGA-1 6. 220KV-FEROZABAD-NIMBARGA-1 7. 220KV-FEROZABAD-NIMBARGA-2 8. NIMBARGA - 220KV
Weather Condition (मौसम स्थिति)	Rainy, Thunder, Windy

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

Generation Loss (MW)	Load Loss (MW)
975.0 MW	66.0 MW

7. **Duration of interruption (रुकावट की अवधि):** 1 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-BPS-YTPS-2
2. 420KV/27KV YTPS-GT-1
3. 420KV/27KV YTPS-GT-2
4. 220KV-SEDAM-FEROZABAD-1
5. ORIENT_SEDAM - 220KV - Bus 1
6. 400KV-BPS-YTPS-1
7. NIMBARGA - 220KV

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

400kV YTPS Generating Station, 400kV Kalaburagi SS, 220 kV Aheri, Nimbarga, Vaishali, Shahbad, Kapnoor, Humnabad, Gulbarga, and Santhapur, 220 kV Bijapur Bus-2, Shahpur Bus-2, Sedam Bus-2 are being radially connected through 400kV BPS YTPS Line-1&2. As per the reports submitted, at 20:27hrs, R-G fault was sensed in 400kV BPS YTPS Line-1 . At both ends, the fault was sensed in zone-1. A/R operated and the line tripped on persistent fault. At 21:52hrs, R-Y fault was observed in 400kV BPS YTPS Line-2 . At YTPS end, the fault was sensed in zone-1. At BPS end, the fault was sensed in carrier aided zone-2 and the line tripped at both ends. Tripping of both lines led to complete outage of all radial connected stations.

11. **DR Analysis:**

400KV-KALABURAGI-YTPS-1

	KALABURAGI - 400KV	YTPS - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:17-03-2026 21:52:10.809 Dis.Pickup L1, Dis.Pickup L2, Dis. forward, Dis. Pickup Z3, Relay PICKUP, Relay PICKUP L1, Relay PICKUP L2 Dis. Pickup Z2 Ir (max): 0.59 kA Iy (max): 0.63 kA	

	Ib (max): 0.20 kA Vr (max): 246.54 kV Vy (max): 247.10 kV Vb (max): 247.14 kV DR Trigger Time:17-03-2026 21:52:10.788 T1 Z2, Z3 Ir (max): 0.59 kA Iy (max): 0.62 kA Ib (max): 0.20 kA Vr (max): 250.50 kV Vy (max): 251.64 kV Vb (max): 250.67 kV	
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400KV-KALABURAGI-YTPS-2

	KALABURAGI - 400KV	YTPS - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:17-03-2026 21:52:10.819 Dis.Pickup L1, Dis.Pickup L2, Dis. forward, Dis. Pickup Z3, Relay PICKUP, Relay PICKUP L1, Relay PICKUP L2 Dis. Pickup Z2 Ir (max): 0.59 kA Iy (max): 0.63 kA Ib (max): 0.20 kA Vr (max): 246.08 kV Vy (max): 247.14 kV Vb (max): 246.62 kV	DR Trigger Time:17-03-2026 21:52:11.080 Any Start Any Trip, DIST Trip A, DIST Trip B, DIST Trip C, Z1, Z2, Z3, RL6- B-PH TO 86M1, RL19- OV/BC/SOTF RL7-A/R LOCK OUT, A/R Lockout, AR Lockout Shot> L12-A/R BLOCK Ir (max): 7.69 kA Iy (max): 6.64 kA Ib (max): 1.22 kA Vr (max): 239.66 kV Vy (max): 234.64 kV Vb (max): 268.99 kV DR Trigger Time:17-03-2026 21:52:11.090 Any Trip, Trip Output A, Trip

		Output B, Trip Output C, Zone 1 Trip, Aided 1 Send, R24- OV/DEF/STRUB AR Start CB NoAR Ir (max): 7.77 kA Iy (max): 6.70 kA Ib (max): 1.23 kA Vr (max): 242.58 kV Vy (max): 237.51 kV Vb (max): 269.58 kV
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400KV/220KV KALABURAGI-ICT-1

	KALABURAGI - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:17-03-2026 20:27:34.245 67/67N pickedup, Relay PICKUP Ir (max): 0.69 kA Iy (max): 0.22 kA Ib (max): 0.23 kA Vr (max): 235.58 kV Vy (max): 236.91 kV Vb (max): 235.37 kV

400KV/220KV KALABURAGI-ICT-2

	KALABURAGI - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:17-03-2026 20:27:34.256 67/67N pickedup, Relay PICKUP Ir (max): 0.70 kA Iy (max): 0.23 kA Ib (max): 0.23 kA Vr (max): 235.36 kV Vy (max): 239.37 kV Vb (max): 236.53 kV DR Trigger Time:17-03-2026 20:27:35.376 67/67N pickedup, Relay PICKUP Ir (max): 0.66 kA Iy (max): 0.24 kA Ib (max): 0.28 kA

	Vr (max): 228.88 kV Vy (max): 235.88 kV Vb (max): 227.77 kV
--	---

SEDAM - 220KV

	SEDAM - 220KV
Time Sync Issue	No
DR Analysis	

YTPS - 400KV

	YTPS - 400KV
Time Sync Issue	No
DR Analysis	

HUMNABAD - 220KV

	HUMNABAD - 220KV
Time Sync Issue	No
DR Analysis	

SHAHABAD - 220KV

	SHAHABAD - 220KV
Time Sync Issue	No
DR Analysis	

KAPNOOR - 220KV

	KAPNOOR - 220KV
Time Sync Issue	No
DR Analysis	

KALABURAGI - 400KV

	KALABURAGI - 400KV
Time Sync Issue	No
DR Analysis	<p>DR Trigger Time:17-03-2026 20:27:34.249 EF Pickup, EF 3I0p Pickup, Relay PICKUP, Relay PICKUP L1, Relay PICKUP E Ir (max): 0.70 kA Iy (max): 0.26 kA Ib (max): 0.26 kA Vr (max): 234.63 kV Vy (max): 237.86 kV Vb (max): 234.69 kV DR Trigger Time:17-03-2026 20:27:34.239 T1 T1 Ir (max): 0.71 kA Iy (max): 0.26 kA Ib (max): 0.28 kA Vr (max): 240.10 kV Vy (max): 241.67 kV Vb (max): 240.56 kV</p>

HALBURGA - 220KV

	HALBURGA - 220KV
Time Sync Issue	No
DR Analysis	

NIMBARGA - 220KV

	NIMBARGA - 220KV
Time Sync Issue	No
DR Analysis	<p>DR Trigger Time:17-03-2026 21:51:33.189</p> <p>Any Start</p> <p>IN>1 Start, IN>2 Start</p> <p>Ir (max): 0.23 kA Iy (max): 0.17 kA Ib (max): 0.33 kA</p> <p>Vr (max): 137.87 kV Vy (max): 138.16 kV Vb (max): 137.72 kV</p> <p>DR Trigger Time:17-03-2026 21:51:33.191</p> <p>Any Start</p> <p>IN>1 Start, IN>2 Start</p> <p>Ir (max): 0.23 kA Iy (max): 0.16 kA Ib (max): 0.33 kA</p> <p>Vr (max): 137.70 kV Vy (max): 138.03 kV Vb (max): 137.68 kV</p> <p>DR Trigger Time:17-03-2026 23:18:05.271</p> <p>Any Start</p> <p>IN>1 Start, IN>2 Start</p> <p>I>2 Start, I>3 Start</p> <p>Any Start</p> <p>IN>1 Start, IN>2 Start</p> <p>Ir (max): 1.04 kA Iy (max): 0.38 kA Ib (max): 0.53 kA</p> <p>Vr (max): 149.71 kV Vy (max): 151.33 kV Vb (max): 150.06 kV</p> <p>DR Trigger Time:17-03-2026 23:18:05.271</p> <p>Any Start</p> <p>IN>1 Start, IN>2 Start</p> <p>I>2 Start, I>3 Start</p> <p>Any Start</p> <p>IN>1 Start, IN>2 Start</p> <p>Ir (max): 1.03 kA Iy (max): 0.38 kA Ib (max): 0.53 kA</p> <p>Vr (max): 149.49 kV Vy (max): 151.41 kV Vb (max): 150.17 kV</p>

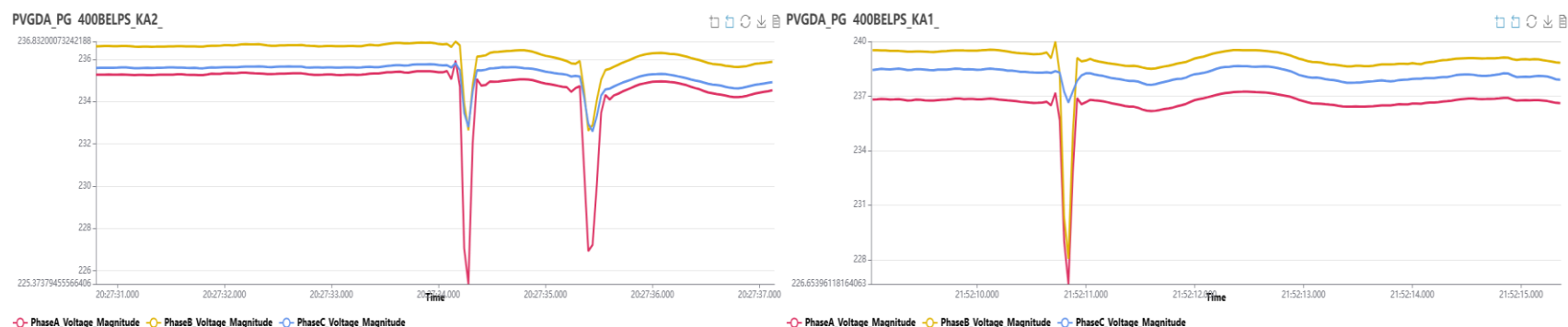
400KV-BPS-YTPS-1

	BPS - 400KV	YTPS - 400KV
Time Sync Issue	No	No
DR Analysis		

400KV-BPS-YTPS-2

	BPS - 400KV	YTPS - 400KV
Time Sync Issue	No	No
DR Analysis		

12. A) PMU Analysis:



From PMU, dip in R-phase is observed at 20:57 hrs indicating R-G fault indicating fault in 400kV BPS YTPS Line-1. At 21:52hrs, dip in and R and Y-phases is observed indicating RY fault during the event in 400kV BPS YTPS Line-2.

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

Constituent	Points for review
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KPTCL	1. Tripping of 400V BPS YTPS Line-1&2 2. Radial connectivity of so many RE plants through 400kV YTPS BPS Line-1&2
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14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

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

16. Restoration Details:

17-03-2026 22:26

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)	KPCL, KPTCL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	KPCL, 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
17-03-2026 21:52:36	YTPS CB TIE 13 - CB 41352 OPEN	YTPS_KA
17-03-2026 21:52:36	YTPS CB TIE 14 - CB 41452 OPEN	YTPS_KA
17-03-2026 21:53:10	YTPS CB TIE 02 - CB 40252 OPEN	YTPS_KA
17-03-2026 21:53:10	YTPS CB TIE 03 - CB 40352 OPEN	YTPS_KA

Detailed Draft Report of grid event submitted by NIMBARGA SS:

Detailed Report

Date of Submission : 24-03-2026 15:18

NIMBARGA - 220KV tripped at 17-03-2026 21:52 and restored at 17-03-2026 22:50

Summary of Event (घटना का सारांश) : In the antecedent condition split bus operation was envisaged at Bijapur SS and hence Nimbarga,Aheri substations were radial on Kalaburgi source At 21.52 Hrs main supply failed to 400kV Kalaburgi SS due to tripping of YTPS-BPS lines one after the other due to line fault.

Load loss of 20MW and Generation loss of 75 MW (Wind 60MW+ Co gen 15 MW) was reported from Nimbarga 220kV SS due to this tripping.

Main supply resumed by closing the Bus coupler at Bijapur substation

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 21:52

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : NIMBARGA - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV- FEROZABAD- NIMBARGA-1 2. NIMBARGA - 220KV - Bus 1	1. 220KV- FEROZABAD- NIMBARGA-2 2. NIMBARGA - 220KV - Bus 2		

Station Connectivity / SLD during antecedent : 220kV side bus configuration at 220kV Nimbarga SS in the prefault condition was as follows:

220kV Bus-I : Kalaburgi-1, Aheri-1, 100MVA Trafo-1;

220kV Bus-II : Kalaburgi-2, Aheri-2, 100MVA Trafo-2; Bus Coupler was in closed condition

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) : Line / PTR flows prior to the incident as per 21.00 Hrs readin:

Kalaburgi Line-1 : 58MW(Export)

Kalaburgi: line-2 58MW(Export)

Aheri Line-1: 62MW (import)

Aheri Line-2 : 62(import)

100VA Trafo-1: 4 MW (Step down)

100MVA Trafo-2: 4 MW(step down)

110kV Kapanoor line: 44MW (export)

110kV Madiyal line : 46 MW (import) (Wind+CO gen)

Kadaganchi line-1 : 5 MW (export)

Kadaganchi line-2 : 5 MW (export)

Renewable Energy Trip : True

Details of SPS Operation (if any): : False

Reason of tripping : Others

Other Reason : Main supply Failed due to tripping of 400kV YTPS-BPS lines, alternate source was not there due to split bus operation envisaged at Bijapur

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Solar Generation Loss (MW)	Wind Generation Loss (MW)	Other Generation Loss (MW)	Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	60 MW	0 MW	75 MW	20 MW

Duration of interruption :
(रुकावट की अवधि)

Details of Equipment Failure (if any during the event): :

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event : 1. NIMBARGA - 220KV

Station Connectivity/SLD during the event :

Analysis of the event : Main supply Failed due to tripping of 400kV YTPS-BPS lines, alternate source was not there due to split bus operation envisaged at Bijapur

Protection / Operational Issues observed : NIL

Restoration Details : Supply resumed at 22.50 Hrs

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) : ALTERNATE SUPPLY TAKEN FROM 220KV AHERI STATION(BIJAPUR SOURCE)

Relay/PLCC Operation Details :

Control Panel Anunciation : NIL

Main I Relay Indications : NIL

Main II Relay Indications : NIL

Other Relay Indications : NIL

PLCC Counter Increment I/T :

PLCC Counter Increment D/T :

Fault Current Value (kAmp) : None

LA Counter :

Remarks :

Attachments : 1. [SLD/Connectivity Diagram](#)

Detailed Draft Report of grid event submitted by KALABURAGI SS:

Detailed Report

Date of Submission : 06-04-2026 15:39

KALABURAGI - 400KV tripped at 17-03-2026 21:52 and restored at 18-03-2026 01:13

Summary of Event (घटना का सारांश) : At 21:53: Main Supply Failed from YTPS end. Both 400kV Bus voltages were Zero. At the same time both YTPS 1 & 2 lines CBs, ICT-1 & ICT-2 CBs were in closed condition along with this all 220kV lines CBs were in charged condition.

22:22- 400kV YTPS line 1 & 2 CBs tripped at our end on DT received 1 and 2. While YTPS line 1 & 2 lines tripped at YTPS end.

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 21:52

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : KALABURAGI - 400KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 400KV- KALABURAGI-YTPS-1 2. 400KV/220KV KALABURAGI-ICT-2	1. 400KV- KALABURAGI-YTPS-2 2. 400KV/220KV KALABURAGI-ICT-1		

Station Connectivity / SLD during antecedent :

Weather Conditions : Rainy

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) : At 20:27hrs 400kV BPS-YTPS line-1 had tripped

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Others

Other Reason : YTPS 1&2 Tripped at our end on DT recieved

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption (रूकावट की अवधि) :

Details of Equipment Failure (if any during the event): :

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event : 1. 400KV-KALABURAGI-YTPS-1
2. 400KV-KALABURAGI-YTPS-2

Station Connectivity/SLD during the event :

Analysis of the event : At 21:53: Main Supply Failed from YTPS end. Both 400kV Bus voltages were Zero. At the same time both YTPS 1 & 2 lines CBs, ICT-1 & ICT-2 CBs were in closed condition along with this all 220kV lines CBs were in charged condition.

22:22- 400kV YTPS line 1 & 2 CBs tripped at our end on DT received 1 and 2. While YTPS line 1 & 2 lines tripped at YTPS end.

22: 05- 220kV Shahapur lines 1 & 2 both H/T at shahapur end

22:32- Supply resumed from 220kV Nimbarga Station

22:34- 500MVA ICT 1 & 2 both HV and LV side tripped on MTR. LV side both ICT 1 & 2 CBs tripped on over flux stage-1 trip (the voltage was 257kV)

23:18- 220kV Sedam line tripped on DPR, MTR, Z-1, R-phase, Dist_3.9km, Ir-1.9kA

23:33- 220kV Kapanoor lines 1 & 2 both H/T at Kapanoor r end

23:40- 220kV Nimbarga line 1 & 2 were H/T as per SLDC instructions.

23:42- 220kV Nimbarga line 1 charged as per SLDC instructions.

00:10- SLDC b'lore issued closing code-SR-4412 to close YTPS-1 line

00:22- 220kV Nimbarga line 1 H/T as per SLDC instructions

00:33- YTPS line -1 charged stood ok

00:55- 500MVA ICT 1 H V side charged stood ok

01:13- 500MVA ICT 1 M V side charged stood ok

01:17- 220kV Nimbarga line 1 charged as per SLDC instructions

Protection / Operational Issues observed :

Restoration Details : 00:33- YTPS line -1 charged stood ok

00:55- 500MVA ICT 1 H V side charged stood ok

01:13- 500MVA ICT 1 M V side charged stood ok

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) : 01:13- 500MVA ICT 1 M V side charged stood ok

01:17- 220kV Nimbarga line 1 charged as per SLDC instructions

Relay/PLCC Operation Details :

Control Panel Anunciation : Yes

Main I Relay Indications : YES

Main II Relay Indications : YES

Other Relay Indications : NO

PLCC Counter Increment I/T : NA

PLCC Counter Increment D/T	:	NA
Fault Current Value (kAmp)	:	1.6
LA Counter	:	NIL
Remarks	:	At 21:53: Main Supply Failed from YTPS end. Both 400kV Bus voltages were Zero. At the same time both YTPS 1 & 2 lines CBs, ICT-1 & ICT-2 CBs were in closed condition along with this all 220kV lines CBs were in charged condition.
Attachments	:	

Detailed Draft Report of grid event submitted by KAPNOOR SS:

Detailed Report

Date of Submission : 19-03-2026 14:42

KAPNOOR - 220KV tripped at 17-03-2026 21:53 and restored at 17-03-2026 22:58

Summary of Event (घटना का सारांश) : AT 21:53Hr 220KV Bus-I and Bus-II dead at 220KV R/s Kapnoor, due to main supply failure at 400KV R/s Firozabad & 220KV R/s Humnabad. Whereas at 220KV Kapnoor end all 220KV lines were in charged condition.

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 21:53

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : KAPNOOR - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type :

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-KAPNOOR-FEROZABAD-1 2. 220KV-KAPNOOR-HUMNABAD-1	1. 220KV-KAPNOOR-FEROZABAD-2 2. 220KV-KAPNOOR-HUMNABAD-2		

Station Connectivity / SLD during antecedent :

Weather Conditions : Rainy, Windy

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): False

Reason of tripping :

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	46 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event : 1.

Station Connectivity/SLD during the event	:	
Analysis of the event	:	
Protection / Operational Issues observed	:	
Restoration Details	:	
DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	—
Main I Relay Indications	:	—
Main II Relay Indications	:	—
Other Relay Indications	:	—
PLCC Counter Increment I/T	:	—
PLCC Counter Increment D/T	:	—
Fault Current Value (kAmp)	:	None
LA Counter	:	—
Remarks	:	AT 21:53Hr 220KV Bus-I and Bus-II dead at 220KV R/s Kapnoor, due to main supply failure at 400KV R/s Firozabad & 220KV R/s Humnabad. Whereas at 220KV Kapnoor end all 220KV lines were in charged condition (No line tripped at our end). At 22:58Hrs main supply resumed from 400KV R/s Firozabad & 220KV R/s Humnabad.
Attachments	:	

Detailed Draft Report of grid event submitted by SHAHABAD SS:

Detailed Report

Date of Submission : 15-04-2026 16:07

SHAHABAD - 220KV tripped at 17-03-2026 21:52 and restored at 18-03-2026 00:33

Summary of Event (घटना का सारांश) : In the Prefault scenario, split bus operation was envisaged at **Bijapur, Shahapur and Sedam 220kV Substation**

Hence, 2x500MVA ICTs at Kalaburgi SS were operating radially with source from 400kV side through YTPS.

Both the units were in running condition at YTPS with total generation of 900MW.

At 20.27 Hrs : 400kV BPS-YTPS line-1 is tripped on R phase to ground fault AR operated , TOR due to persistent fault, fault current 4.2kA, 152 km, Due to heavy rain and thunder storms charging was delayed.

At 21.52 Hrs: 400kV BPS-YTPS line-2 is tripped on Line to Line (R-Y) fault. Zone-2 aided trip. During line inspection, at conductor is snapped near to YTPS(Tower location 11 &12)

YTPS units could not sustain after to tripping of both YTPS-BPS 1 &2 lines. Tripping of units at YTPS resulted in main supply failed to Kalaburgi 400kV SS and downstream 220kV substations.

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 21:52

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : SHAHABAD - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements

Station Connectivity / SLD during antecedent :

Weather Conditions :

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : True

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None, None

Auto Reclosure Operation : Yes

Fault Clearing Time (ms) : None

Load and Generation Loss (लोड और जेनरेशन हानि) :

Solar Generation Loss (MW)	Wind Generation Loss (MW)	Other Generation Loss (MW)	Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	162 MW	0 MW	162 MW	232 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
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List of elements tripped during the event : 1.

Station Connectivity/SLD during the event :

Analysis of the event : In the Prefault scenario, split bus operation was envisaged at Bijapur, Shahapur and Sedam 220kV Substations

Hence, 2x500MVA ICTs at Kalaburgi SS was operating radially with source from 400kV side through YTPS.

Both the units were in running condition at YTPS with total generation of 900MW.

At 20.27 Hrs : 400kV BPS-YTPS line-1 is tripped on R phase to ground fault AR operated , TOR due to persistent fault, fault current 4.2kA, 152 km, Due to heavy rain and thunder storms charging was delayed.

At 21.52 Hrs: 400kV BPS-YTPS line-2 is tripped on Line to Line (R-Y) fault. Zone-2 aided trip. During line inspection, at conductor is snapped near to YTPS(Tower location 11 &12)

YTPS units could not sustain after to tripping of both YTPS-BPS 1 &2 lines. Main supply

failed to Kalaburgi 400kV SS and downstream substations.

The Load and generation in the Kalaburgi downstream was as follows:

Sl.NO.	SS name	Load in MW	Wind Generation in MW
1	Bijapur	0	116
2	Aheri	2	0
3	Nimbarga	8	46
4	Halabarga	8	0
5	Humnabad	26	0
6	Shahabad	90	0
7	Kapanoor	46	0
8	Shahapur	42	6
9	Sedam	4	0
10	Santhpura	6	0
	Total	232MW	162MW

Protection / Operational Issues observed : NIL

Restoration Details : **On 18.03.2026**

00:33 - YTPS line -1 charged stood ok

00:55- 500MVA ICT 1 was restored

YTPS line-2 500MVA ICT 2 was kept open and restored on 18.03.2026.

On 18.03.2026 at 8.06 Hrs : YTPS line 2 was restored

8.23 Hrs 500MVA ICT-2 was restored

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) : BPS-YTPS line-2 fault was attended

Relay/PLCC Operation Details :

Control Panel Anunciation :

Main I Relay Indications :

Main II Relay Indications	:	
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	Tripping of YTPS-BP line-1 and Line-2 and running units at YTPS resulted in Main supply failure to Kalaburgi 400kV SS and downstream 220kV substations.
Attachments	:	

Detailed Draft Report of grid event submitted by HUMNABAD SS:

Detailed Report

Date of Submission : 24-03-2026 15:15

HUMNABAD - 220KV tripped at 17-03-2026 21:52 and restored at 17-03-2026 23:43

Summary of Event (घटना का सारांश) : Main supply failed to Humnabad Ss due to tripping of 400kV YTPS-BPS lines due to line fault

Load loss of 26MW is reported from Humnabad SS

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 21:52

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : HUMNABAD - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type :

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements

Station Connectivity / SLD during antecedent : 220kV side bus configuration at 220kV Humnabad SS in the prefault condition was as follows:

220kV Bus-I : Kapanur-1, Halburga - 1, Sedam-1 & 100MVA Trafo-1;

220kV Bus-II : Kapanur-2, Halburga - 2, Sedam-2 & 100MVA Trafo-2; Bus Coupler was in closed condition

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) : 220kV side bus configuration at 220kV Humnabad SS in the prefault condition was as follows:

220kV Bus-I : Kapanur-1, Halburga - 1, Sedam-1 & 100MVA Trafo-1;

220kV Bus-II : Kapanur-2, Halburga - 2, Sedam-2 & 100MVA Trafo-2; Bus Coupler was in closed condition

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Others

Other Reason : Main supply failed to Humnabad SS from Kapanoor & Sedam SS due to tripping of 2x500MVA ICTs at 400kv Ferozabad

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	26 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event): :

Equipment Type	Equipment Make
List of elements tripped during the event	: 1.
Station Connectivity/SLD during the event	:
Analysis of the event	: During the incident main supply failed to Humnabad 220kV SS due to tripping of 2x500MVA ICTs at Kalaburgi SS (ferozabad). Humnabad was radial on Kalaburgi Ss through Kapanoor- Humnabad D/C lines & Sedam- Humnabad lines. Load loss of 26 MW was reported from Humnabad SS due to this tripping. Charging delayed due to high voltage
Protection / Operational Issues observed	:
Restoration Details	: At 23.43 Hrs supply restored to Humnabad SS
DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या)	: False
Remedial Measures Taken (सुधारात्मक सुझाव)	:
Relay/PLCC Operation Details	:
Control Panel Anunciation	: NIL
Main I Relay Indications	: NIL
Main II Relay Indications	: NIL
Other Relay Indications	:
PLCC Counter Increment I/T	:
PLCC Counter Increment D/T	:
Fault Current Value (kAmp)	: None
LA Counter	:
Remarks	: No tripping at 220kV Humnabad substation
Attachments	:

Detailed Draft Report of grid event submitted by YTPS SS:

Detailed Report

Date of Submission : 20-03-2026 18:36

YTPS - 400KV tripped at 17-03-2026 21:52 and restored at 17-03-2026 22:26

- Summary of Event (घटना का सारांश)** :
- YTPS-BPS-1 line was in tripped on fault in R-N at a distance 11.13 KM from YTPS end at 20:27:34 hrs. SLDC concurrence was awaited for test charging of the line due thunder storm & windy weather condition.
 - due to tripping of YTPS-BPS-1 line, YTPS-BPS-2 line was carrying appx. 830 MW load, when Zone-01 Phase to Phase fault occurred between R and Y phase of YTPS-BPS-2 line at the location of 2.2 KM from YTPS end at 21:52:11 hrs with fault current magnitude of Ia-7.249kA and Ib-6.112kA and faulted phases voltage being V an – 118kV and Vbn – 116.5kV were recorded .
 - YTPS-BPS-2 line Main (413-52) and Tie breakers (414-52) opened immediately at YTPS end and DT was sent to remote end.
 - Generator-1 & Generator-2 tripped on low forward power protection.
 - 400KV YTPS Station black out happened consequent to blackout at 400KV KALABURAGI end.

Time and Date of the event : 17-03-2026 21:52
(घटना का समय और दिनांक)

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : YTPS - 400KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 400KV-KALABURAGI-YTPS-1 2. 400KV-KALABURAGI-YTPS-2 3. 400KV-BPS-YTPS-1 4. 400KV-BPS-YTPS-2	1. 420KV/27KV YTPS-GT-1 2. 400KV/11.5KV YTPS-ST-1 3. 400KV/11.5KV YTPS-ST-2 4. 420KV/27KV YTPS-GT-2		

Station Connectivity / SLD during antecedent :

Weather Conditions : Thunders, Windy

Elements under outage prior to the event : 1. 400KV-BPS-YTPS-1

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : LL

phases inv : None, None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : 79.98

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
899 MW	0 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
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List of elements tripped during the event :
1. 400KV-BPS-YTPS-2
2. 420KV/27KV YTPS-GT-1
3. 420KV/27KV YTPS-GT-2

Station Connectivity/SLD during the event :

Analysis of the event :

- YTPS-BPS-1 line was in tripped on fault in R-N at a distance 11.13 KM from YTPS end at 20:27:34 hrs. SLDC concurrence was awaited for test charging of the line due thunder storm & windy weather condition.
- due to tripping of YTPS-BPS-1 line, YTPS-BPS-2 line was carrying appx. 830 MW load, when Zone-01 Phase to Phase fault occurred between R and Y phase of YTPS-BPS-2 line at the location of 2.2 KM from YTPS end at 21:52:11 hrs with fault current magnitude of Ia-7.249kA and Ib-6.112kA and faulted phases voltage being V an – 118kV and Vbn – 116.5kV were recorded .

- YTPS-BPS-2 line Main (413-52) and Tie breakers (414-52) opened immediately at YTPS end and DT was sent to remote end.
- Generator-1 & Generator-2 tripped on low forward power protection.
- 400KV YTPS Station black out happened consequent to blackout at 400KV KALABURAGI end.

Protection / Operational Issues observed : The Power evacuation corridor at YTPS is very much strained in the event of tripping of either of 400KV YTPS-BPS line-1 OR YTPS-BPS line-2.

Restoration Details :

- YTPS-BPS line-1 was charged on 17.03.2026 at 22:26 hrs.
- YTPS-KALABURAGI line -1 was charged on 18.03.2026 at 00:33 hrs.
- YTPS Unit#2 was synchronised to grid on 18.03.2026 at 05:36 hrs.
- YTPS-KALABURAGI line -2 was charged on 18.03.2026 at 08:07 hrs.
- YTPS-BPS line-2 was charged on 19.03.2026 at 20:08 hrs.

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) : R-Phase conductor snapping was observed between Tower No. 11 & 12 from YTPS station. The rectification work was carried out by KPTCL-TLM division on 19.03.2026 and line was restored on 19.03.2026 at 20:08 hrs.

Relay/PLCC Operation Details :

Control Panel Anunciation :

Main I Relay Indications :

Main II Relay Indications :

Other Relay Indications :

PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	
Attachments	:	

Detailed Draft Report of grid event submitted by SEDAM SS:

Detailed Report

Date of Submission : 23-03-2026 14:19

SEDAM - 220KV tripped at 17-03-2026 21:52 and restored at 23-03-2026 14:15

Summary of Event (घटना का सारांश) : 220kV Bus coupler is in H/T Charged Condition on 17.03.2026 @ 21:52Hrs to Hrs

BUS-1 Lines Load details:

100MVA Power Transformer No-1 =53MW

220kV Ramasamudra line-1 = -33MW

220kV Ramasamudra line-2 = -33MW

220kV Tandur line= 32MW

220kV Orient cement = 15MW

BUS-2 Lines Load details:

100MVA Power Transformer No-2 =4MW

220kV Humnabad line-1 = 14MW

220kV Humnabad line-2 = 14MW

220kV Ferozabad =-34MW

220kV Shree Cement=2MW

220kV Clean max Solar=0MW

220KV sedam-ferozabad Tripped on Distance protection relay faulty phase-R, Zone-1, distance (d)=21.69km, if=1.009kA.

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 21:52

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : SEDAM - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-SEDAM-TANDUR-1 2. 220KV-SEDAM-RAMASAMUDRA-1 3. 220KV-SEDAM-RAMASAMUDRA-2 4. ORIENT_SEDAM - 220KV - Bus 1	1. 220KV-SEDAM-FEROZABAD-1 2. 220KV-SEDAM-HUMNABAD-1 3. 220KV-SEDAM-HUMNABAD-2 4. SHREECEMENT_SEDAM - 220KV 5. CLEANMAX_SEDAM - 220KV		

Station Connectivity / SLD during antecedent :

Weather Conditions : Rainy, Thunders

Elements under outage prior to the event : 1. 220KV-SEDAM-FEROZABAD-1

Other Information :
(Antecedent Conditions)

Renewable Energy Trip : False

Details of SPS Operation : False
(if any):

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : None

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	34 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment :
Failure (if any during the
event):

Equipment Type	Equipment Make
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List of elements tripped : 1. 220KV-SEDAM-FEROZABAD-1
during the event 2. ORIENT_SEDAM - 220KV - Bus 1

Station Connectivity/SLD :
during the event

Analysis of the event : 220kV Bus coupler is in H/T Charged
Condition on 17.03.2026 @ 21:52Hrs to Hrs

BUS-1 Lines Load details:

100MVA Power Transformer No-1 =53MW

220kV Ramasamudra line-1 = -33MW

220kV Ramasamudra line-2 = -33MW

220kV Tandur line= 32MW

220kV Orient cement = 15MW

BUS-2 Lines Load details:

100MVA Power Transformer No-2 =4MW

220kV Humnabad line-1 = 14MW

220kV Humnabad line-2 = 14MW

220kV Ferozabad =-34MW

220kV Shree Cement=2MW

220kV Clean max Solar=0MW

220KV sedam-ferozabad Tripped on Distance
protection relay faulty phase-R, Zone-1,
distance (d)=21.69km, if=1.009kA.

Protection / Operational :
Issues observed

Restoration Details :

DR Time synchronization : False
issues observed (सुरक्षा/
प्रचालन समस्या)

Remedial Measures Taken :
(सुधारात्मक सुझाव)

Relay/PLCC Operation :
Details

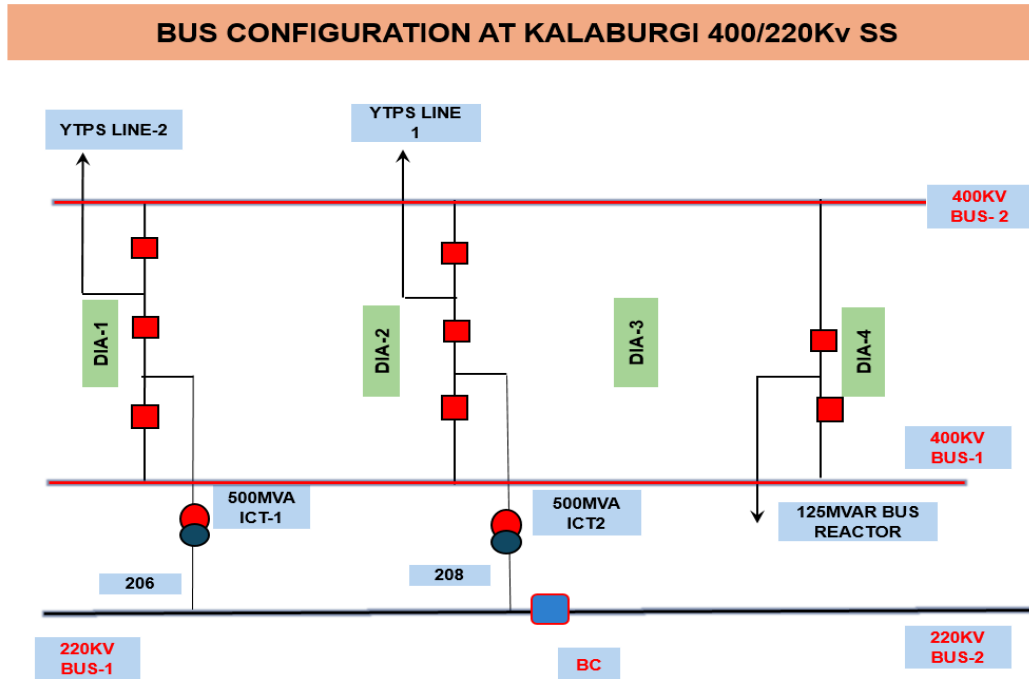
Control Panel Anunciation : Trip

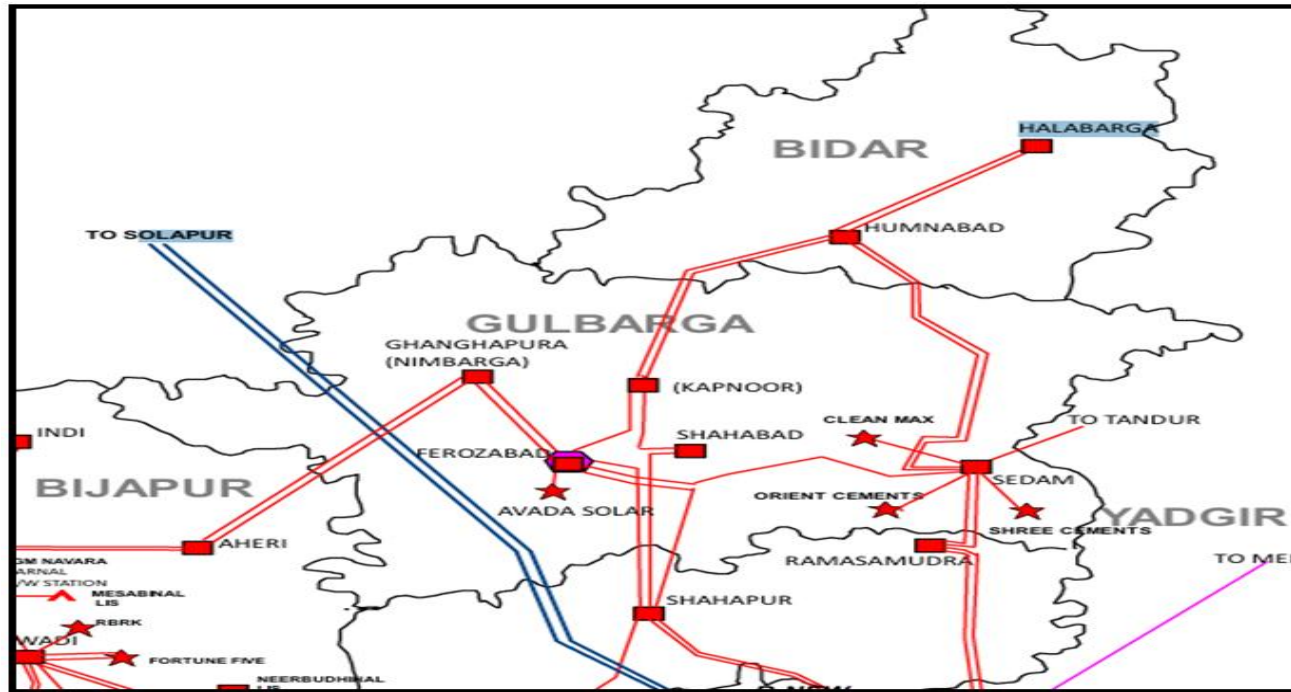
Main I Relay Indications :

Main II Relay Indications	:	Distance prot opearated
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	1.009
LA Counter	:	
Remarks	:	
Attachments	:	

Deliberations:

1. KPTCL stated that, under pre-fault conditions, split bus operation had been implemented at Bijapur, Shahapur and Sedam 220 kV Substations. Accordingly, 2×500 MVA ICTs at Kalaburgi Substation were operating radially with source from the 400 kV side through YTPS. It was further informed that both the units at YTPS were running with total generation of around 900 MW.





2. KPTCL informed that on 17.03.2026 at 20:27 hrs, 400 kV BPS–YTPS Line-1 tripped on R-phase to ground fault. Auto-reclosure operated and subsequently tripped on lockout due to persistent fault. The fault current was around 4.2 kA and the fault location indicated was approximately 152 km from BPS end.
3. It was further informed that due to heavy rain and thunderstorm conditions, charging of the line was delayed. Subsequently, at 21:52 hrs, 400 kV BPS–YTPS Line-2 tripped on Line-to-Line (R-Y) fault with Zone-2 aided trip at BPS end. The nature of fault was identified as conductor snapping near YTPS end between Tower Locations 11 and 12.
4. KPTCL stated that since the load connected to 400/220 kV Kalaburgi Substation was only around 232 MW, the running units at YTPS tripped, resulting in failure of main supply to 400 kV Kalaburgi Substation and downstream 220 kV substations.
5. Regarding remedial measures taken, KPTCL informed that after attending the line fault, YTPS–BPS Line-2 was restored on 19.03.2026 at 20:08 hrs. It was further stated that SLDC had been requested to take suitable remedial measures to maintain load-generation balance immediately after tripping of any one of the YTPS–BPS lines in future.
6. KPCL stated that following tripping of YTPS–BPS Lines 1 and 2, the generating units tripped on low forward power. KPCL further highlighted that frequent trippings on YTPS–BPS lines were being observed due to faults at around 8–12 km from YTPS end. KPTCL acknowledged the repeated trippings and informed that issues related to certain insulators had been identified in the said section and field staff were presently carrying out replacement of faulty insulators.

7. KPCL further highlighted that YTPS–Kalaburgi Lines 1 and 2 were generally operating in import mode only. Accordingly, after tripping of YTPS–BPS lines, the generating units were tripping on low forward power due to non-availability of evacuation path, resulting in generation loss. KPCL requested that YTPS–Kalaburgi lines may also be operated in export mode. KPTCL informed that the events were being reviewed and removal of bus split in the upstream network of Kalaburgi was being planned to address the issue.
8. MS, SRPC suggested that KARSLDC may formulate a suitable SOP such that, upon tripping of one of the YTPS–BPS lines, YTPS–Kalaburgi lines could be operated in export mode. KPTCL stated that the matter would be discussed with SLDC and the status would be updated subsequently.
9. SE, SRPC enquired regarding the generation and load loss during the event. KPTCL stated that approximately 1100 MW of generation loss and around 232 MW of load loss had occurred during the incident. SE, SRPC highlighted that the incident involved substantial generation loss. All entities concerned were requested to remain vigilant regarding protection system healthiness and reliability to avoid such generation and load loss incidents.
10. SRPC requested SRLDC to ensure verification of generation and load loss details in the Grid Event reports being forwarded.

Recommendations:

- ✚ KPTCL to formulate SOP to manage the YTPS generation and grid upon tripping of single YTPS-BPS line.
- ✚ Time synch issues to be rectified at various stations and compliance report to be furnished.
- ✚ ER, DL & TAR for many 220 kV stations not furnished. KPTCL to take up with concerned entities and copy of the same shall be furnished.
- ✚ KPCL to submit feedback to KPTCL (Planning) to ensure reliable evacuation.

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 220kV Renew_Surya_Koppal of RENEW	220kV Renew_Surya_Koppal is connected radially to KOPPAL through 220 kV-KOPPAL-Renew_Surya_Koppal-1. The triggering incident is the R-G fault in the 220 kV-KOPPAL-Renew_Surya_Koppal-1 line and tripping of the only line connected to 220kV Renew_Surya_Koppal led to the Complete Outage 220 kV Renew_Surya_Koppal of RENEW	18-03-2026 22:28	301	0	GD - 1	26-03-2026	19-03-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

220kV Renew_Surya_Koppal is connected radially to KOPPAL through 220KV-KOPPAL-Renew_Surya_Koppal-1. The triggering incident is the R-G fault in the 220KV-KOPPAL-Renew_Surya_Koppal-1 line and tripping of the only line connected to 220kV Renew_Surya_Koppal led to the Complete Outage 220kV Renew_Surya_Koppal of RENEW

2. Time and Date of the Event (घटना का समय और दिनांक: 18-03-2026 22:28

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)	9822	9765
Karnataka State Generation (MW)	6211	6147
Grid Frequency (Hz)	50.02	50.03
SR Demand (MW)	48319	48207

SR Generation (MW)	47211	46937
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***Pre and post data of 1 minute before and after the event**

Elements under outage	1. Renew_Surya_Koppal - 220KV
Weather Condition (मौसम स्थिति)	Rainy, Thunders

At RSOPL:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. Renew_Surya_Koppal - 220KV 2. 220KV/33KV Renew_Surya_Koppal-ICT-1 3. 220KV/33KV Renew_Surya_Koppal-ICT-2	

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

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

7. Duration of interruption (रुकावट की अवधि): 1 hours, 35 minutes

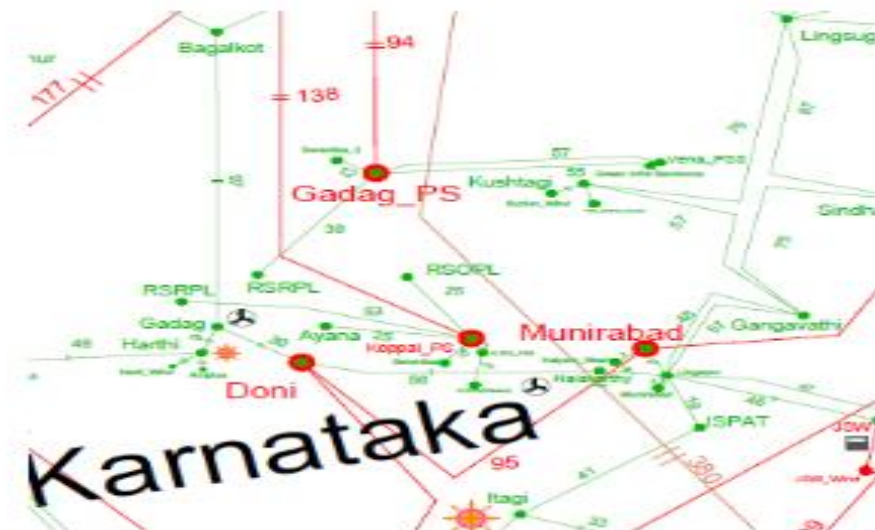
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. Renew_Surya_Koppal - 220KV
2. 220KV-KOPPAL-Renew_Surya_Koppal-1

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

220kV Renew_Surya_Koppal is connected radially to KOPPAL through 220KV-KOPPAL-Renew_Surya_Koppal-1. The triggering incident is the R-G fault in the 220KV-KOPPAL-Renew_Surya_Koppal-1 line during heavy rain and lightening. At both ends, the fault was sensed in differential protection. At Koppal end, A/R operated and the line was holding. At RSRPL end, A/R did not trip and the line tripped. Tripping of the only line connected to 220kV Renew_Surya_Koppal led to the Complete Outage 220kV Renew_Surya_Koppal of RENEW.



11. DR Analysis:

220KV-KOPPAL-Renew_Surya_Koppal-1

	KOPPAL - 220KV	Renew_Surya_Koppal - 220KV
Time Sync Issue	No	No
DR Analysis	DR is not available	DR Trigger Time:18-03-2026 22:28:11.819 Any Dist Start Any Trip, Diff Trip, Trip Output A, Trip Output B, R-ph Trip Relay, Spare Zone P Trip Diff InterTrip Carr Rec CH-1, Carr Rec CH-1 Aid 1 Dist Trip A/R Block 86.1 Trip Relay, 86.2 Trip Relay, 87L1 Optd To PMU

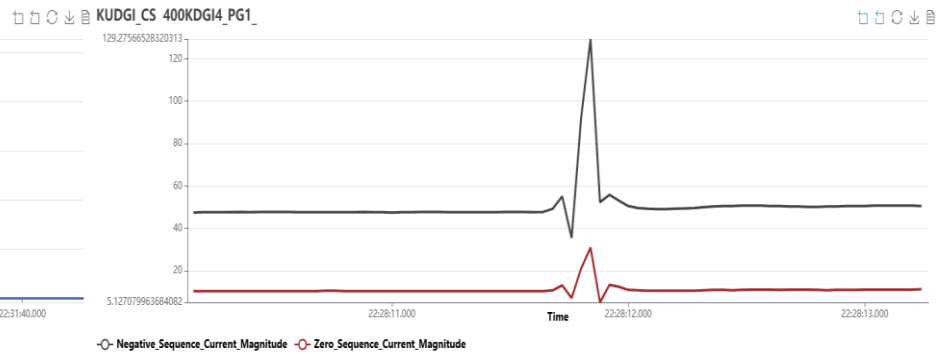
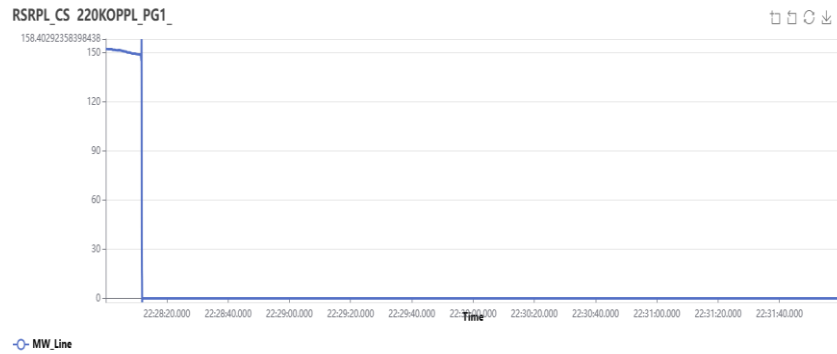
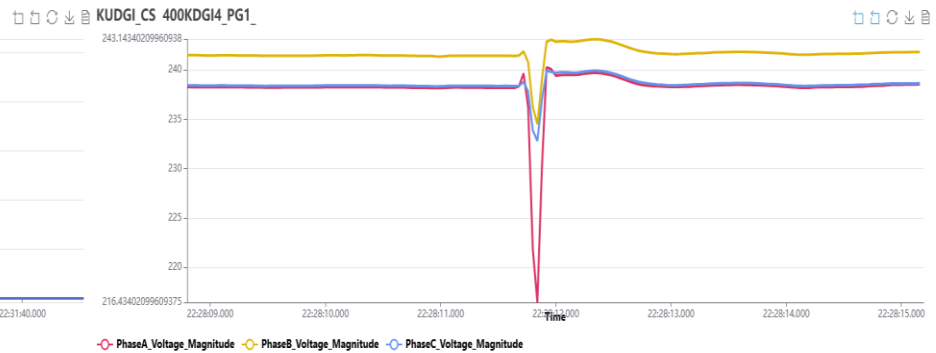
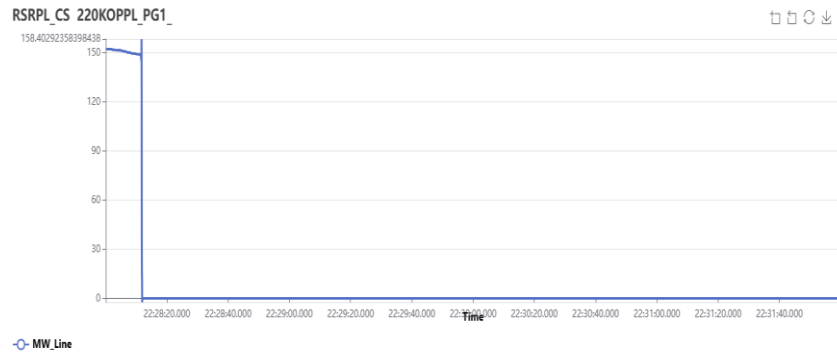
		CB B-ph Open Ir (max): 0.99 kA Iy (max): 0.39 kA Ib (max): 0.41 kA Vr (max): 141.24 kV Vy (max): 138.42 kV Vb (max): 139.96 kV DR Trigger Time:18-03-2026 22:28:11.819 Any Dist Start Any Trip, Diff Trip, Trip Output A, Trip Output B, R-ph Trip Relay, Spare Zone P Trip Diff InterTrip Carr Rec CH-1, Carr Rec CH-1 Aid 1 Dist Trip A/R Block 86.1 Trip Relay, 86.2 Trip Relay, 87L1 Optd To PMU CB B-ph Open Ir (max): 0.99 kA Iy (max): 0.39 kA Ib (max): 0.41 kA Vr (max): 141.24 kV Vy (max): 138.42 kV Vb (max): 139.96 kV
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Renew_Surya_Koppal - 220KV

	Renew_Surya_Koppal - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:18-03-2026 22:28:11.819 Any Dist Start Any Trip, Diff Trip, Trip Output A, Trip Output B, R-ph Trip Relay, Spare Zone P Trip

Diff InterTrip
 Carr Rec CH-1, Carr Rec CH-1
 Aid 1 Dist Trip
 A/R Block
 86.1 Trip Relay, 86.2 Trip Relay, 87L1 Optd To PMU
 CB B-ph Open
 Ir (max): 0.99 kA Iy (max): 0.39 kA Ib (max): 0.41 kA
 Vr (max): 141.24 kV Vy (max): 138.42 kV Vb (max):
 139.96 kV

12. A) PMU Analysis:



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

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

Constituent	Points for review
INDIGRID	Non submission of FIR, EL and DR at Koppal end
RENEW POWER PVT LTD	1. Non operation of A/R at RSRPL end

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

Constituent	Remedial Actions
RENEW POWER PVT LTD	At the time of tripping, heavy rain and lightning were observed in the area. Post-fault patrolling and inspection of the transmission line and associated PSS / protection system have been completed, and no abnormalities were observed.

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

16. Restoration Details:

Renew_Surya_Koppal - 220KV tripped at 18-03-2026 22:28 and restored at 19-03-2026 00:03

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)	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
18-03-2026 22:58:39	RENEW SURYA OJAS CB 30252 (LOAD-2 CPCR) CLOSED	RSOPL_CS
18-03-2026 22:58:41	RENEW SURYA OJAS CB 30152 (LOAD-1 WND) CLOSED	RSOPL_CS
18-03-2026 22:58:42	RENEW SURYA OJAS CB 30252 (LOAD-2 CPCR) OPEN	RSOPL_CS
18-03-2026 22:58:46	RENEW SURYA OJAS CB 30152 (LOAD-1 WND) OPEN	RSOPL_CS

Detailed Draft Report of grid event submitted by Renew Surya Koppal SS:

Detailed Report

Date of Submission : 19-03-2026 20:00

Renew_Surya_Koppal - 220KV tripped at 18-03-2026 22:28 and restored at 19-03-2026 00:03

Summary of Event (घटना का सारांश) : Renew_Surya_Koppal - 220KV - RENEW POWER PVT LTD) 220kV line 204 Bay Tripped on B-Phase Ground distance protection during Heavy rain and lightning nearby site areas.

Main 1: Fault current IL1: 0.55 kA; M1 Fault distance: 26.8 km

Main 2:

IA: 725.0 Amps

IB: 202.4 Amps

IC: 252.4 Amps

IN: 646.6 Amps

M2 Fault distance: 50.55 km

Time and Date of the event (घटना का समय और दिनांक) : 18-03-2026 22:28

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : Renew_Surya_Koppal - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with

details of Bus split Operation (if any)

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. Renew_Surya_Koppal - 220KV 2. 220KV/33KV Renew_Surya_Koppal-ICT-1 3. 220KV/33KV Renew_Surya_Koppal-ICT-2			

Station Connectivity / SLD during antecedent : Station Under Normal Condition prior to the occurrence of Grid Disturbance Event.

Weather Conditions : Thunders

Elements under outage prior to the event : 1. Renew_Surya_Koppal - 220KV

Other Information (Antecedent Conditions) : Renew_Surya_Koppal - 220KV - RENEW POWER PVT LTD) 220kV line 204 Bay Tripped on B-Phase Ground distance protection.

Main 1: Fault current IL1: 0.55 kA; M1 Fault distance: 26.8 km

Main 2:

IA: 725.0 Amps

IB: 202.4 Amps

IC: 252.4 Amps

IN: 646.6 Amps

M2 Fault distance: 50.55 km

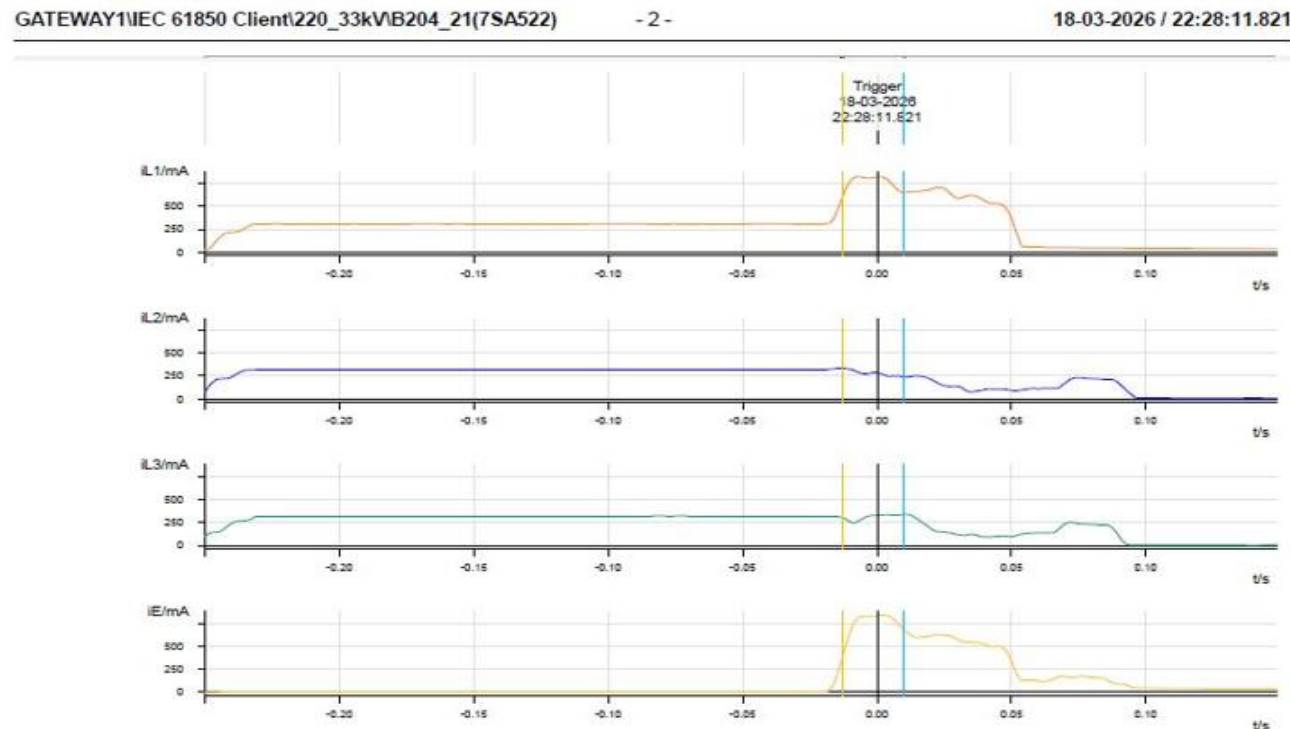
Renewable Energy Trip	:	False				
Details of SPS Operation (if any):	:	False				
Reason of tripping	:	Fault Tripping				
Type of Fault	:	SLG				
phases inv	:	None, None				
Auto Reclosure Operation	:	No				
Fault Clearing Time (ms)	:	39.0				
Load and Generation Loss (लोड और जेनरेशन हानि)	:					
<table><tr><th>Total Generation Loss (MW)</th><th>Total Load Loss(MW)</th></tr><tr><td>301.45 MW</td><td>185 MW</td></tr></table>			Total Generation Loss (MW)	Total Load Loss(MW)	301.45 MW	185 MW
Total Generation Loss (MW)	Total Load Loss(MW)					
301.45 MW	185 MW					
Duration of interruption (रुकावट की अवधि)	:					
Details of Equipment Failure (if any during the event):	:					
<table><tr><th>Equipment Type</th><th>Equipment Make</th></tr></table>			Equipment Type	Equipment Make		
Equipment Type	Equipment Make					
List of elements tripped during the event	:	1. 220KV-KOPPAL-Renew_Surya_Koppal-1				
Station Connectivity/SLD during the event	:	Station was under Normal Condition prior to theoccurence of Grid Disturbance Event.				
Analysis of the event	:	Renew_Surya_Koppal - 220KV - RENEW POWER PVT LTD) 220kV line 204 Bay Tripped on B-Phase Ground distance protection during Heavy rain and lightning nearby site areas. Main 1: Fault current IL1: 0.55 kA; M1 Fault distance: 26.8 km				

	:	Main 2:
	:	IA: 725.0 Amps
	:	IB: 202.4 Amps
	:	IC: 252.4 Amps
	:	IN: 646.6 Amps
	:	M2 Fault distance: 50.55 km
Protection / Operational Issues observed	:	Nil
Restoration Details	:	At the time of tripping, heavy rain and lightning were observed in the area. Post-fault patrolling and inspection of the transmission line and associated PSS / protection system have been completed, and no abnormalities were observed.
DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	At the time of tripping, heavy rain and lightning were observed in the area. Post-fault patrolling and inspection of the transmission line and associated PSS / protection system have been completed, and no abnormalities were observed.
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	Master 86 trip, Distance protection operated, line Differential operated.
Main I Relay Indications	:	R-Phase to Ground distance protection operated.
Main II Relay Indications	:	R-Phase to Ground distance protection operated.
Other Relay Indications	:	Nil
PLCC Counter Increment I/T	:	1

PLCC Counter Increment D/T	:	0
Fault Current Value (kAmp)	:	0.55
LA Counter	:	R-Phase: 1count increased.
Remarks	:	Nil
Attachments	:	1. Others 2. Others 3. Others

Deliberations:

1. RENEW Power stated that 220 kV RSRPL–Koppal line bay tripped at 22:28:11 hrs on 18.03.2026. It was informed that 220 kV Line Bay -204 tripped on B-phase to ground fault, on line distance protection operation, during heavy rain and lightning in nearby areas. The M1 fault distance from local end (RSRPL PSS) was indicated as 26.8 km with fault current IL1 of around 0.55 kA. The M2 fault distance was indicated as 50.55 km.
2. Bay-204 disturbance recorder data and fault current details corresponding to Event M1 (Differential Relay) were presented before the forum.



3. Regarding remedial measures taken, RENEW informed post-fault patrolling and inspection of the transmission line and associated PSS/protection systems had been completed and no abnormalities were observed.
4. SRPC enquired regarding the status of Auto Reclosure operation during the event. RENEW stated that there was an issue in the Auto Reclosure logic at their end and hence Auto Reclosure did not operate at Renew side during the event. However, it was confirmed that Auto Reclosure had operated successfully at Koppal end.
5. SRLDC raised concern regarding non-submission of FIR, DR and EL details by M/s Indigrid. SRPC instructed M/s Indigrid to immediately furnish the required details. Non-compliance of IEGC Regulations by M/s Indigrid was noted by the forum.

Recommendations:

- ✚ M/s Renew to enable the Auto reclosure at their end.
- ✚ M/s Indigrid to submit detailed report for the event.
- ✚ M/s Indigrid to submit DR, EL, FIR to SRLDC & SRPC for the event.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
5	Complete Outage of 220kV ZENATARIS_PSS	220 kV Zenataris_PSS is connected to Hiriur through 220KV-HIRIYUR-ZENATARIS_PSS-1. As per the reports submitted, the triggering incident was YB fault in 220KV-HIRIYUR-ZENATARIS_PSS-1 and the line tripped. Tripping of the only connected line led to complete outage of ZENATARIS_PSS - 220KV	21-03-2026 14:09	0	0	GD - 1	16-04-2026	-	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:**1. Event Summary (घटना का सारांश):**

220kV Zenataris_PSS is connected to Hiriur through 220KV-HIRIYUR-ZENATARIS_PSS-1. As per the reports submitted, the triggering incident was YB fault in 220KV-HIRIYUR-ZENATARIS_PSS-1 and the line tripped. Tripping of the only connected line led to complete outage of ZENATARIS_PSS - 220KV

2. Time and Date of the Event (घटना का समय और दिनांक: 21-03-2026 14:09)**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)	14862	14925
Karnataka State Generation (MW)	9293	9344
Grid Frequency (Hz)	49.86	49.81
SR Demand (MW)	61816	61812
SR Generation (MW)	49815	49884

**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	0.0 MW	0.0 MW
Wind	0.5 MW	
Others	0.0 MW	
Total	0.5 MW	

7. Duration of interruption (रुकावट की अवधि): 4 hours, 53 minutes

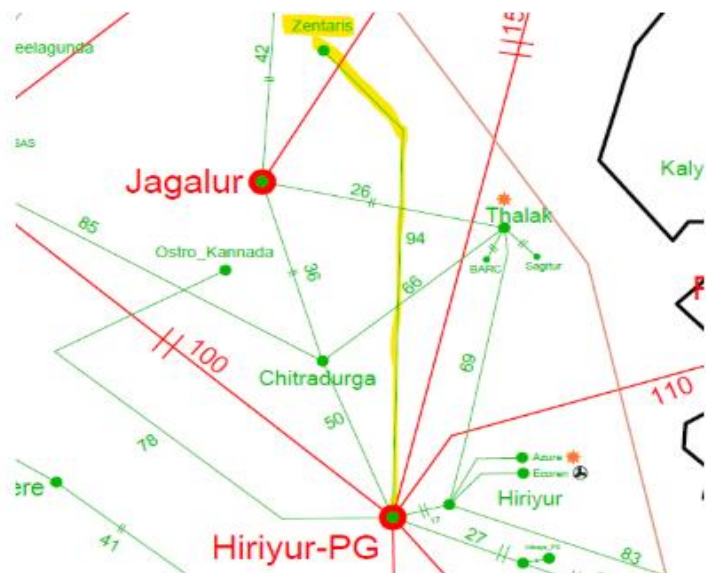
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-HIRIYUR-ZENATARIS_PSS-1

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

220kV Zenataris_PSS is connected to Hiriyur through 220KV-HIRIYUR-ZENATARIS_PSS-1. 220 kV Hiriyur is connected to 220 kV Zenataris. The triggering incident was Y-B fault in the line which was located from 42.3 km away from Hiriyur end. At Hiriyur end fault was sensed in Zone 1 and 3ph tripped. At Zenataris end fault was not sensed. Tripping of the only connected line led to complete outage of ZENATARIS_PSS - 220KV



11. DR Analysis:

220KV-HIRIYUR-ZENATARIS_PSS-1

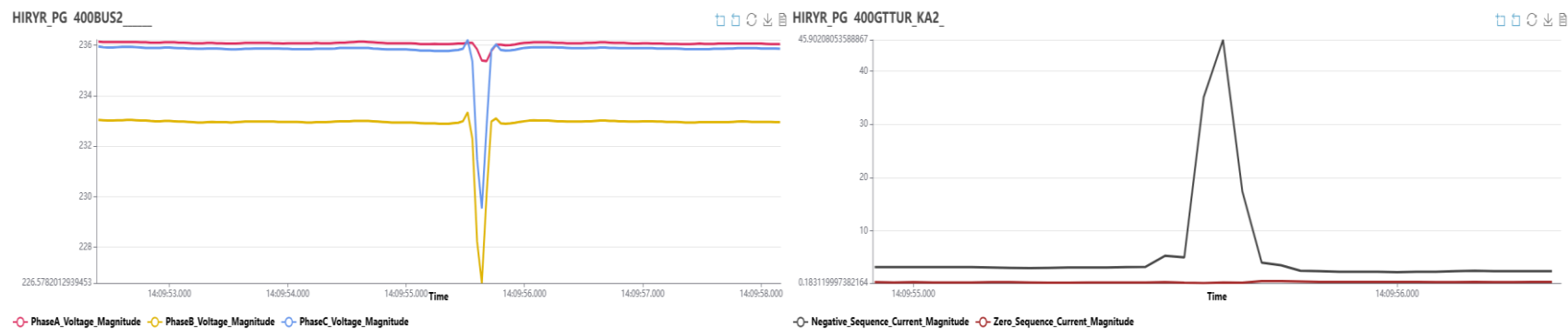
	HIRIYUR - 220KV	ZENATARIS_PSS - 220KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:21-03-2026 14:09:55.615 MAIN_Z1_OPTD, MAIN_Z2_START, MAIN_Z3_START, START_AR MAIN1_TRIP, MAIN CB AR LO, TIE_CB_LO, M1/2_CARR_SEND, FAULT_LOOP_B FAULT_LOOP_Y MAIN2_TRIP MAIN_CB_B_OPEN MAIN_CB_R_OPEN, TIE_CB_R_OPEN MAIN_CB_Y_OPEN,	Line Holding

	TIE_CB_Y_OPEN TIE_CB_B_OPEN PREP_3PH_TR_M/T Ir (max): 0.03 kA Iy (max): 3.37 kA Ib (max): 3.36 kA Vr (max): 138.70 kV Vy (max): 134.47 kV Vb (max): 130.51 kV DR Trigger Time:21-03-2026 15:09:55.127 STARTAR 65501, 3PH TRIP 65499, M2_TRIP 65493, M2Z1_OP 65492, M2Z2_ST 65491, M2Z3_ST 65489 M1_TRIP 65494 M CB_BO 65508 M CB_RO 65510 M CB_YO 65509 PR3P_TR 65442 T CB_RO 65504 T CB_YO 65503 T CB_BO 65502 Ir (max): 0.03 kA Iy (max): 3.38 kA Ib (max): 3.36 kA Vr (max): 139.26 kV Vy (max): 134.59 kV Vb (max): 130.21 kV	
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ZENATARIS_PSS - 220KV

	ZENATARIS_PSS - 220KV
Time Sync Issue	No
DR Analysis	Supply Failure. No DR uploaded.

12. A) PMU Analysis:



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

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:

21/03/2026 19:02

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

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

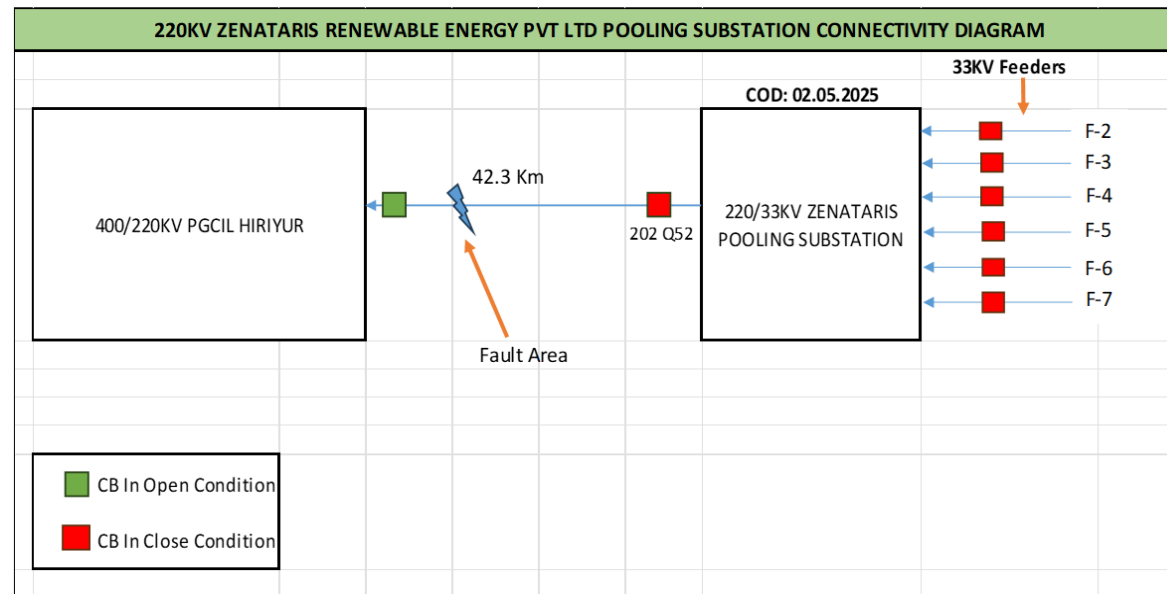
Annexure 1

Sequence of Events as per SCADA

time	Event	Location
21-03-2026 14:09:59	HIRIYUR CB TIE 16 - CB 21652 OPEN	HIRYR_PG
21-03-2026 14:09:59	HIRIYUR CB TIE 17 - CB 21752 OPEN	HIRYR_PG
21-03-2026 14:10:14	ZENTARIS CB 20452 (T2_P) INVALID	ZNTRS_CS
21-03-2026 14:10:14	ZENTARIS CB 32452 (T2_S) BETWEEN	ZNTRS_CS
21-03-2026 14:10:14	ZENTARIS CB 32552 (T1_S) OPEN	ZNTRS_CS

Deliberations:

1. M/s Zentaris stated that, under antecedent conditions, weather was cloudy with thunderstorms prevailing in the area.



2. Zentaris informed that on 21.03.2026 at 14:09 hrs, 220 kV line tripped on Y-B phase fault under Zone-1 distance protection at PGCIL end with indicated fault location at around 42.3 km. The fault current was around 3 kA in both the phases.
3. SRPC enquired whether the breaker had opened at Zentaris end. Zentaris stated that no tripping occurred at their end and no fault had been detected by the relays. It was further informed that the matter had been referred to the OEM and OEM representatives were analysing the issue at site.
4. SRPC further enquired regarding the nature of the fault. Zentaris stated that post-event line patrolling had been carried out; however, no fault was observed on the line.

Recommendations:

- M/s Zentaris to submit the detailed report of the event, mentioning the reason for non-sensing of not detecting the fault at the generator end during the event.

S. No.	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
6	Complete Outage of 220kV Serentica_RI3PL_Gadag_Solar and 220kV Serentica_RI3PL_Gadag_wind	As per the reports submitted, the triggering incident was R-G fault in 220 kV-GADAG_PSS-Serentica_RI3PL_Gadag_Solar-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Serentica_RI3PL_Gadag_Solar and 220kV Serentica_RI3PL_Gadag_wind	23-03-2026 21:58	0	0	GD - 1	02-04-2026	26-03-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:**1. Event Summary (घटना का सारांश):**

As per the reports submitted, the triggering incident was R-G fault in 220KV-GADAG_PSS-Serentica_RI3PL_Gadag_Solar-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Serentica_RI3PL_Gadag_Solar and 220kV Serentica_RI3PL_Gadag_wind

2. Time and Date of the Event (घटना का समय और दिनांक: 23-03-2026 21:58)**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)	11914	11871

Karnataka State Generation (MW)	6686	6703
Grid Frequency (Hz)	50.03	50.08
SR Demand (MW)	54935	54936
SR Generation (MW)	46145	46052

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

Elements under outage	1. 220KV-GADAG_PSS-Serentica_RI3PL_Gadag_S-1
Weather Condition (मौसम स्थिति)	Normal

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

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

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

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

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

1. 220KV-GADAG_PSS-Serentica_RI3PL_Gadag_S-1

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

As per the reports submitted, the triggering incident was R-G fault in 220KV-GADAG_PSS-Serentica_RI3PL_Gadag_Solar-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV Serentica_RI3PL_Gadag_Solar and 220kV Serentica_RI3PL_Gadag_wind

11. DR Analysis:

220KV-GADAG_PSS-Serentica_RI3PL_Gadag_S-1

	Serentica_RI3PL_Gadag_S - 220KV	GADAG_PSS - 220KV
Time Sync Issue	No	No

DR Analysis	DR is not unloaded	DR Trigger Time:23-03-2026 21:58:38.301 MAIN1_TRIP, MAIN2_TRIP, MAIN1_Z1_OPTD, M1/2_CARR_SEND MAIN_CB_R_OPEN Ir (max): 26.16 kA Iy (max): 0.32 kA Ib (max): 0.34 kA Vr (max): 147.60 kV Vy (max): 133.39 kV Vb (max): 132.59 kV
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Serentica_RI3PL_Gadag_S - 220KV

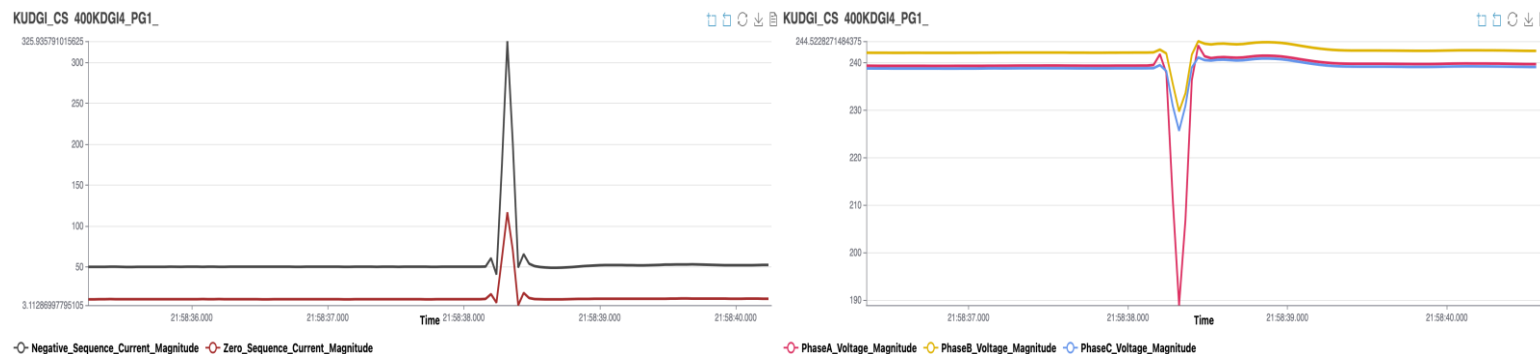
	Serentica_RI3PL_Gadag_S - 220KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:23-03-2026 21:58:38.289 21_STFWL1, 21_STFWPE M1Z3_START M1Z2_START 67N_START Not Used, SPARE CB_OPEN_R CB_OPEN_Y, CB_OPEN_B BRC_START FSD1-BLKU Ir (max): 1.09 kA Iy (max): 0.31 kA Ib (max): 0.35 kA Vr (max): 138.63 kV Vy (max): 131.70 kV Vb (max): 130.80 kV

Serentica_RI3PL_Gadag_W - 220KV

	Serentica_RI3PL_Gadag_W - 220KV
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Time Sync Issue	No
DR Analysis	DR is not available

12. A) PMU Analysis:



From the PMU, dip in R-phase is observed indicating R-G fault 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:

Serentica_RI3PL_Gadag_S - 220KV tripped at 23-03-2026 21:58 and restored at 23-03-2026 21:58

Serentica_RI3PL_Gadag_W - 220KV tripped at 23-03-2026 21:58 and restored at 24-03-2026 00:19

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)	SERENTICA_RI1PL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	GTL, SERENTICA_RI1PL

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

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
23-03-2026 21:58:40	GADAG CB TIE 26 - CB 42652 OPEN	GADAG_PG
23-03-2026 21:58:40	GADAG CB TIE 27 - CB 42752 OPEN	GADAG_PG
23-03-2026 21:58:40	GADAG CB 22052 (T6_S) OPEN	GADAG_PG
23-03-2026 21:58:41	SERNICA3 HYBRID CB 20152 (LINE TO GADAG) OPEN	SRNTH_CS

Detailed Draft Report of grid event submitted by Serentica RI3PL Gadag W SS:

Detailed Report

Date of Submission : 26-03-2026 07:59

Serentica_RI3PL_Gadag_W - 220KV tripped at 23-03-2026 21:58 and restored at 24-03-2026 00:19

Summary of Event (घटना का सारांश) : no events recorded at wind end,
SRI3PL gadag spolar PSS bay 201 got tripped on Ground fault operated , trouble shooting done found normal CB charged stood ok .
CB's not oprated for wind only tripped solar side GTL.
SRI3PL gadag Wind restored on 24/03/2026 at 00:19 hrs.

Time and Date of the event (घटना का समय और दिनांक) : 23-03-2026 21:58

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : Serentica_RI3PL_Gadag_W - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Single Bus

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements

Station Connectivity / SLD during antecedent : GTL line to solar , solar to wind linne (bay-202)
GTL 220kv line opted, remaining not opted

Weather Conditions : Rainy, Thunders

Elements under outage prior to the event : 1. 220KV-Serentica_RI3PL_Gadag_S-Serentica_RI3PL_Gadag_W-1
2. 220KV/33KV Serentica_RI3PL_Gadag_W-ICT-1
3. 220KV/33KV Serentica_RI3PL_Gadag_W-ICT-2

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): False

Reason of tripping :

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
22.98 MW	22.98 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event : 1.

Station Connectivity/SLD during the event :

Analysis of the event	:	SRI3PL gadag spolar PSS bay 201 got tripped on differential protection operated , trouble shooting done found normal CB charged stood ok . SRI3PL gadag Wind restored on 24/03/2026 at 00:19 hrs.
Protection / Operational Issues observed	:	
Restoration Details	:	
DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	Checked all are found normal charged stood ok
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	not opted
Main I Relay Indications	:	no indications
Main II Relay Indications	:	no indications
Other Relay Indications	:	no indications
PLCC Counter Increment I/T	:	no opted
PLCC Counter Increment D/T	:	no opted
Fault Current Value (kAmp)	:	0.0
LA Counter	:	R-7, Y -6, B-6
Remarks	:	wind side CB's not opetd , tripped only solar incomer GTL line
Attachments	:	

Detailed Draft Report of grid event submitted by Serentica RI3PL Gadag S SS:

Detailed Report

Date of Submission : 26-03-2026 15:23

Serentica_RI3PL_Gadag_S - 220KV tripped at 23-03-2026 21:58 and
restored at 23-03-2026 21:58

Summary of Event (घटना का
सारांश) :

Time and Date of the event : 23-03-2026 21:58
(घटना का समय और दिनांक)

Name of the Substation/Generating
Station/Pooling Station affected
(Along with Voltage level) : Serentica_RI3PL_Gadag_S - 220KV

Event Category (श्रेणी के साथ इवेंट
प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . :
Along with details of Bus split
Operation (if any)

Bus Configuration Type : Single Bus

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV/33KV Serentica_RI3PL_Gadag_S-ICT-1 2. 220KV/33KV Serentica_RI3PL_Gadag_S-ICT-2			

Station Connectivity / SLD
during antecedent : GTL - SOLAR - WIND

Weather Conditions : Rainy, Thunders

Elements under outage prior to
the event : 1. 220KV-GADAG_PSS-Serentica_RI3PL_Gadag_S-1

Other Information (Antecedent
Cnditions) : line to ground fault opted with 1716 amp in R phase,
fault duarition is 81 ms

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : 81.0

Load and Generation Loss (लौड
और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption (रुकावट
की अवधि) :

Details of Equipment Failure (if
any during the event):

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during
the event : 1. 220KV-GADAG_PSS-Serentica_RI3PL_Gadag_S-1

Station Connectivity/SLD during
the event :

Analysis of the event : SRI3PL Gadag Solar PSS Bay-201 CB got tripped on M1Z2
and M1Z3 and 21STFWL1 and 21STFWPE and 67N start
protection Relay @ 21:58 Hrs. Cause due to transient trip
because of Heavy lightning and Rain at Gadag
Region.

Protection / Operational Issues
observed :

Restoration Details :

DR Time synchronization issues
observed (सुरक्षा/ प्रचालन समस्या) : False

Remedial Measures Taken
(सुधारात्मक सुझाव) : Checked found there is no abnormal and Reset done

Relay/PLCC Operation Details :

Control Panel Anunciation : REL670

Main I Relay Indications : 21_Z2 and 21_Z3, 86

Main II Relay Indications	:	
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	1.71
LA Counter	:	R-6, Y-5, B-6
Remarks	:	
Attachments	:	

Deliberations:

1. There was no representation from M/s Serentica.
2. M/s Serentica to furnish EL, DR & TAR

Recommendations:

1. M/s Serentica to furnish EL, DR & TAR.
2. M/s Serentica to submit the detailed report on the incident.

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 TP SAURYA of TATA POWER	220kV TP SAURYA is connected radially to KOPPAL through 220KV-TP SAURYA LIMITED-KOPPAL-1. The triggering incident is the R-G fault in the 220KV-TP SAURYA LIMITED-KOPPAL-1 line and tripping of the only line connected to 220kV TP SAURYA led to the Complete Outage of 220kV TP SAURYA of TATA POWER	25-03-2026 16:23	7	0	GD - 1	10-04-2026	03-04-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:**1. Event Summary (घटना का सारांश):**

220kV TP SAURYA is connected radially to KOPPAL through 220KV-TP SAURYA LIMITED-KOPPAL-1. The triggering incident is the R-G fault in the 220KV-TP SAURYA LIMITED-KOPPAL-1 line and tripping of the only line connected to 220kV TP SAURYA led to the Complete Outage of 220kV TP SAURYA of TATA POWER

2. Time and Date of the Event (घटना का समय और दिनांक: 25-03-2026 16:23)**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)	15527	15516

Karnataka State Generation (MW)	8591	8590
Grid Frequency (Hz)	49.93	49.91
SR Demand (MW)	67144	67094
SR Generation (MW)	53758	53729

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At Koppal SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-TP SAURYA LIMITED-KOPPAL-1	1. TP SAURYA LIMITED - 220KV - Bus 1

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): 4 hours, 9 minutes

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

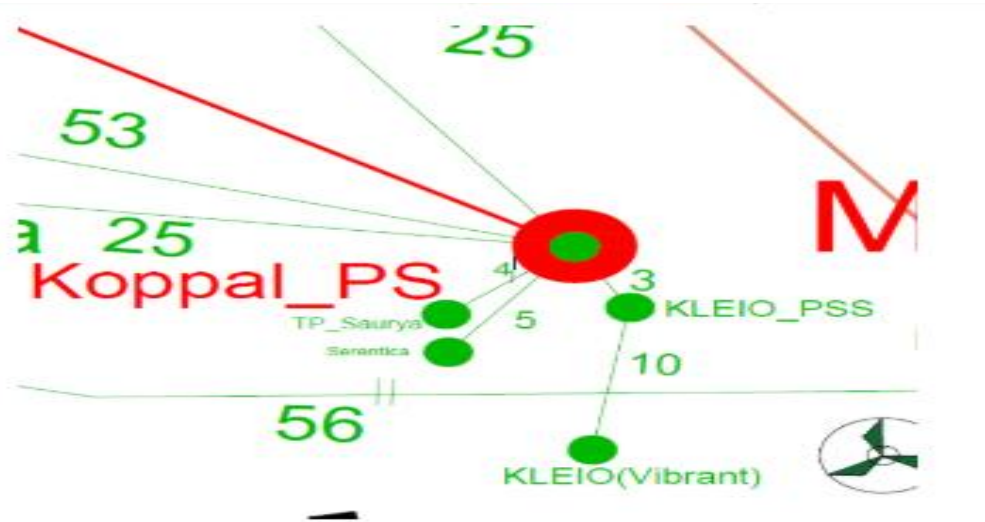
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-TP SAURYA LIMITED-KOPPAL-1
2. TP SAURYA LIMITED - 220KV

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

As per the reports submitted, the triggering incident was B-G fault in 220kV Koppal TP Sourya line. At TP Sourya end, the fault was sensed in line differential protection and the line tripped. However, the same could not be verified at Koppal end due to non submission of FIR, DR, EL and TR. Tripping of the only

connected line led to complete outage of TP SAURYA LIMITED - 220kV.



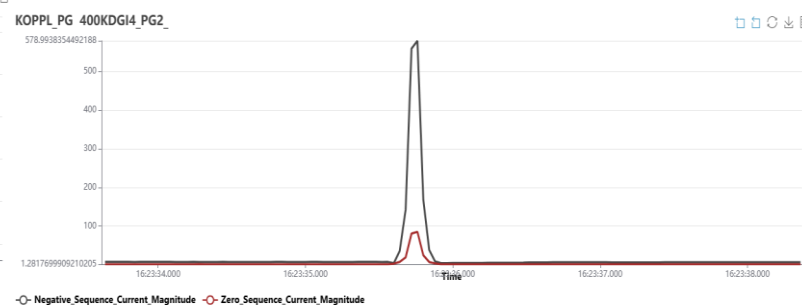
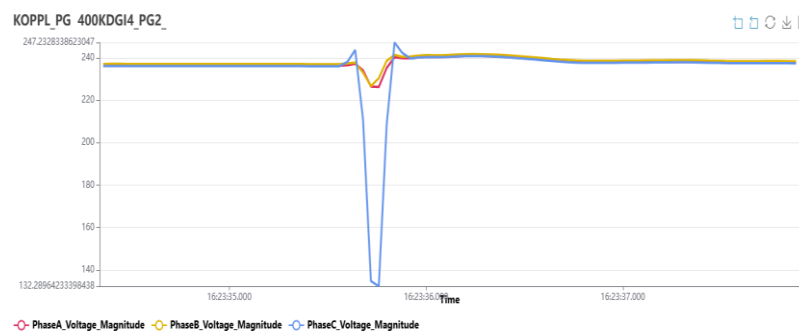
11. DR Analysis:

220KV-TP SAURYA LIMITED-KOPPAL-1

	TP SAURYA LIMITED - 220KV	KOPPAL - 220KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:25-03-2026 16:23:35.850 67N_START, 27_START L3CPDIF_START, L3CPDIF_STL3, L3CPDIF_BLK2H, L3CPDIF_BLK2HL3 ZMFCPDIS_STNDL3 R PH. TRIP, Y PH. TRIP, B PH. TRIP L3CPDIF_TRIP, L3CPDIF_TRL3, L3CPDIF_TRIPUNRE LDLPDIF_TRIP, LDLPDIF_TRL3,	DR is not available

	LDLPSCH_TRLOCAL, LDLPDIF_TRLOCL3, PROTECTION_TRIP, START AR AR01_INHIBIT, B_PH_FAULT 86A RELAY OPTD., 86B RELAY OPTD. L3CPDIF_TRIPRES LDLPSCH_TRREMOTE CB OPEN RPH, CB OPEN BPH CB OPEN YPH REM_CB_OPEN L3CPDIF_BLK2H, L3CPDIF_BLK2HL3 46_BRCPTOC_START CAR FL FROM DTPC Ir (max): 0.33 kA Iy (max): 0.34 kA Ib (max): 0.42 kA Vr (max): 131.93 kV Vy (max): 166.58 kV Vb (max): 129.83 kV	
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12. A) PMU Analysis:



From the 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
TATA	1. Non operation of A/R at TP Sourya end.
INDIGRID	1. Non submission of FIR, DR, EL at Koppal end.

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

Constituent	Remedial Actions
TATA	During the eperiod of tripping heavy wind, thunder storm and rain occured at this area, Inspected the line for abnormalities and suspecting sag issues. Informed to SRLDC for for test charging and charged the line at 20:32

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

16. Restoration Details:

Complete Outage of 220kV TP SAURYA of TATA POWER @ 25-03-2026 16:23 and restored at 25-03-2026 20:32

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

Sl. No	Issues	Regulation non-compliance	Utilities
1	Flash Report not received within 8 Hours	IEGC section 37.2 (b)	TATA
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
25-03-2026 16:23:37	KOPPAL CB 20352 (LINE TO TPSRL) OPEN	KOPPL_PG

Detailed Draft Report of grid event submitted by TP SAURYA LIMITED SS:

Detailed Report

Date of Submission : 03-04-2026 16:08

TP SAURYA LIMITED - 220KV tripped at 25-03-2026 16:23 and
restored at 25-03-2026 20:32

Summary of Event (घटना
का सारांश) :

Time and Date of the event : 25-03-2026 16:23
(घटना का समय और दिनांक)

Name of the : TP SAURYA LIMITED - 220KV
Substation/Generating
Station/Pooling Station
affected (Along with
Voltage level) :

Event Category (श्रेणी के
साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus :
(HV/LV) . Along with
details of Bus split
Operation (if any)

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-TP SAURYA LIMITED-KOPPAL- 1	1. TP SAURYA LIMITED - 220KV - Bus 1	1. TP SAURYA LIMITED - 220KV - Bus 2	

Station Connectivity / SLD : On dated 25.03.26, TP SL line bay 204 tripped
during antecedent on differential protection specifically on the
B phase, at 16:23, with the fault current

recorded as Ib-322.5A, In-660.0A & Ib
remote 19.25kA. During the eperiod of
tripping heavy wind, thuder storm and rain
occured at this area.

Weather Conditions : Rainy, Thunders, Windy

Elements under outage :
prior to the event

Other Information :
(Antecedent Cnditions)

Renewable Energy Trip : False

Details of SPS Operation : False
(if any):

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None, None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : 55.0

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
252 MW	0 MW

Duration of interruption :
(रुकावट की अवधि)

Details of Equipment :
Failure (if any during the
event):

Equipment Type	Equipment Make
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List of elements tripped : 1. TP SAURYA LIMITED - 220KV
during the event 2. 220KV-TP SAURYA LIMITED-KOPPAL-1

Station Connectivity/SLD during the event	:	KNTL thalakal
Analysis of the event	:	On dated 25.03.26, TPSL line bay 204 tripped on differential protection specifically on the B phase, at 16:23, with the fault current recorded as Ib-322.5A, In-660.0A & Ib remote 19.25kA. During the eperiod of tripping heavy wind, thuder storm and rain occured at this area.
Protection / Operational Issues observed	:	Differential Peotectetion was operated and specifically mentioned as B phase
Restoration Details	:	The transmission line was inspected, and no abnormalities were found. During the tripping period, rain, thunder, and wind were present at the location
DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	During the eperiod of tripping heavy wind, thunder storm and rain occured at this area, Inspected the line for abnormalities and suspecting sag issues. Informed to SRLDC for test charging and charged the line at 20:32
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	nil
Main I Relay Indications	:	Differential trip and B phase fault alarms triggered
Main II Relay Indications	:	Differential trip
Other Relay Indications	:	EF Start
PLCC Counter Increment I/T	:	1
PLCC Counter Increment D/T	:	3

Fault Current Value (kAmp)	:	0.322
LA Counter	:	4
Remarks	:	Nil
Attachments	:	

Deliberations:

1. This event was discussed in 141st PCSC meeting under GD-7.
2. Indigrid advised to provide the EI, DR as per IEGC section 37.2 (c) & CEA grid Standard 15.3 time 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
8	Complete Outage of 220kV SAEL2	The triggering incident was R-G fault in 220 kV-KURNOOL_PG_III-SAEL2-1 and the line tripped. Tripping of the only connected line led to complete outage of 220 kV SAEL2	29-03-2026 15:52	150	60	GD - 1	07-04-2026	31-03-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

The triggering incident was R-G fault in 220KV-KURNOOL_PG_III-SAEL2-1 and the line tripped. Tripping of the only connected line led to complete outage of 220kV SAEL2

2. Time and Date of the Event (घटना का समय और दिनांक: 29-03-2026 15:52)

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)	12641	12585
Andhra Pradesh State Generation (MW)	7188	7136
Grid Frequency (Hz)	50.06	50.04
SR Demand (MW)	66014	65787
SR Generation (MW)	47569	47257

**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)
150.0 MW	60.0 MW

7. Duration of interruption (रुकावट की अवधि): 1 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. 220KV-SAEL1-KURNOOL_PG_III-1

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

As per the reports submitted, the triggering incident was R-G fault in 220kV Kurnool_PG_III SAEL2-1. At Kurnool end, the fault was sensed in differential protection, DT was received and the line tripped without A/R operation. At SAEL end, the fault was sensed in differential protection, R-pole opened and DT was sent to remote end. A/R operated at SAEL end but the RE plant could not survive due to non availability of reference voltage as it has grid following inverters. Tripping of only connected line led to complete outage of 220kV SAEL2

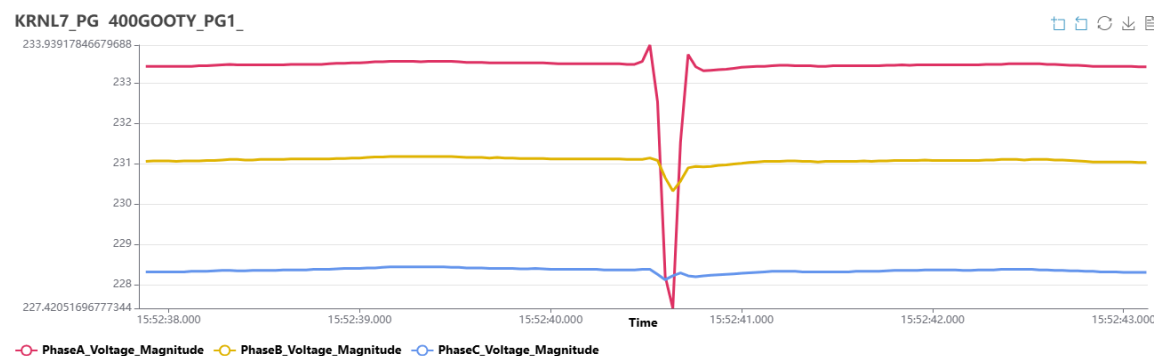
11. DR Analysis:

220KV-KURNOOL_PG_III-SAEL2-1

	KURNOOL_PG_III - 220KV	SAEL2 - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:29-03-2026 15:52:40.610 87L_STL1, 87L_BLK2H, 87L_BLK5H 87L_STARTRES	DR Trigger Time:29-03-2026 15:52:40.603 DIFF_START_RPH, DIFF_BLK_2H, DIFF_BLK_2H_RPH,

<p> MAIN1_Z2_START, MAIN1_Z3_START, 21_STFWL1, 21_STFWPE, ZCPSCH_CS DEF_ST, 67N_START MAIN2_TRIP M1/2 CARR.SEND DIFF_OPTD, 87L_TRIP, 87L_TRL1 LDLPSCH_TRIP, LDLPSCH_TRL1, START_AR MAIN1_TRIP CARF_CH1 FAULT_LOOP_R DTRE_CH2 DT_REC_CH1/2, BLOCK_AR DTRE_CH1 LDLPSCH_TRREM GRA_OP, GRB_OP CARR_CH1 PR3_TR_M 3PH_GR_A/B_OPTD M2CAR_RE MAIN_CB_R_OPEN MAIN1/2_CARR_REC, CARR_AID_TRIP, PRE3_TR BRC START MAIN_CB_Y_OPEN MAIN_CB_B_OPEN DEF_ST, 67N_START PSD_ZIN, PSD_ZOUT Ir (max): 11.56 kA Iy (max): 0.42 kA Ib (max): 0.44 kA Vr (max): 122.84 kV Vy (max): 194.31 kV Vb (max): 193.23 kV </p>	<p> DIFF_BLK_5H, DIFF_BLK_5H_RPH DEF_START_FW DIST_START_PE, DIST_START_ND_R DEF_START MAIN2_PROTN_OPTD CARR_RCV_CH-2 DT_SEND_CH-2 DT_SEND_CH-1 DIST_START_ND_B, CARR_RCV_CH-1 DIFF_START_RES DIFF_TRIP_RPH, DIFF_L_TRIP, DIFF_L_TRIP_RPH, DIFF_TRIP_REMOTE DIFF_TRIP_LOCAL ZONE-3_START DIFF_BLK_2H, DIFF_BLK_2H_RPH CB_RPH_OPEN DEF_START_RV PREPARE_3PH_TRIP AR LOCKOUT OPTD SOTF_INIT CB_CLS R Ir (max): 0.51 kA Iy (max): 0.42 kA Ib (max): 0.44 kA Vr (max): 123.35 kV Vy (max): 191.62 kV Vb (max): 190.38 kV </p>
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12. A) PMU Analysis:



From PMU 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
PGCIL SR-1	1. Non operation of A/R at Kurnool end.
SAEL	1. Reason for sending DT from SAEL end after differential protection operation

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

Constituent	Remedial Actions
SAEL	Will plan for detailed Settings of the relays and will ensure if any abnormalities

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

16. Restoration Details:

SAEL2 - 220KV tripped at 29-03-2026 15:55 and restored at 30-03-2026 14:18

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)	SAEL
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	SAEL
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
29-03-2026 15:57:43	SAEL MP1 CB 33752 (T2_1_S) INVALID	SAEL1_CS
29-03-2026 16:02:37	SAEL MP2 CB 31052 (T2_1_S) OPEN	SAEL2_CS
29-03-2026 16:02:37	SAEL MP2 CB 30852 (T1_1_S) OPEN	SAEL2_CS
29-03-2026 16:02:37	SAEL MP2 CB 32952 (LOAD-1 FUTTR) OPEN	SAEL2_CS
29-03-2026 16:02:37	SAEL MP2 CB 31752 (T1_2_S) OPEN	SAEL2_CS

Detailed Draft Report of grid event submitted by SAEL 2 SS:

Detailed Report

Date of Submission : 31-03-2026 14:18

SAEL2 - 220KV tripped at 29-03-2026 15:55 and restored at 30-03-2026 14:18

Summary of Event (घटना का सारांश) :

Time and Date of the event (घटना का समय और दिनांक) : 29-03-2026 15:55

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : SAEL2 - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type :

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements

Station Connectivity / SLD during antecedent :

Weather Conditions :

Elements under outage prior to the event :

Other Information (Antecedent Conditions) : During the tripped time there was a intermittent weather conditions in plant and TL Area.

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Others

Other Reason : Intermittent weather

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
150 MW	60 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event): :

Equipment Type	Equipment Make

List of elements tripped during the event : 1.

Station Connectivity/SLD during the event :

Analysis of the event : Checked All the equipments and line patrolling done no abnormalities has been observed.

Protection / Operational Issues observed :

Restoration Details :

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	Will plan for detailed Settings of the relays and will ensure if any abnormalities.
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	
Main I Relay Indications	:	DIFF START R & B PHASES OPTD
Main II Relay Indications	:	DIFF OPTD
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	
Attachments	:	

Deliberations:

1. SAEL stated that on 29.03.2026 at 15:52 hrs, the GISS end breaker had tripped due to operation of Line Differential Protection (M2 relay).
2. It was informed that following the protection operation, a Direct Transfer Trip (DTT) command was successfully transmitted to the PGCIL end, resulting in tripping of the remote end breaker. SAEL further stated that the local/site end breaker remained healthy and no abnormality was observed in its operation.
3. Subsequently, detailed inspection of the transmission line and comprehensive health checks of all associated equipment, including protection systems and primary equipment, were carried out. No abnormalities or faults were detected during the inspection. It was further informed that trial charging of the line was carried out at 17:55 hrs and the line successfully withstood the system conditions without any further protection operation or abnormal behaviour.
4. SRPC enquired regarding the reason for initiation of Direct Transfer Trip (DTT). SAEL stated that the matter had been referred to the OEM and the response was awaited.
5. SRPC highlighted the DR time synchronisation issue observed at SAEL end and requested SAEL to rectify the same at the earliest.

Recommendations:

 ***SAEL to rectify the DR time sync issues.***

 ***SAEL to submit the detailed report for DT sending during the event in consultation with OEM.***

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 Renew_Surya_Koppal of RENEW	As per the reports submitted, the triggering incident was tripping of 220kV Koppal-RSRPL line while charging 220/33kV ICT-2 at 220kV Renew_Surya_Koppal and DT was sent to Koppal end and the line tripped. Tripping of the only connected line led to complete outage of 220kV Renew_Surya_Koppal.	30-03-2026 14:11	1	0	GD - 1	15-04-2026	-	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 tripping of 220kV Koppal-RSRPL line while charging 220/33kV ICT-2 at 220kV Renew_Surya_Koppal and DT was sent to Koppal end and the line tripped. Tripping of the only connected line led to complete outage of 220kV Renew_Surya_Koppal.

2. Time and Date of the Event (घटना का समय और दिनांक: 30-03-2026 14:11)

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)	16170	16304
Karnataka State Generation (MW)	9807	9826
Grid Frequency (Hz)	50.11	50.14
SR Demand (MW)	69162	69411
SR Generation (MW)	53026	52971

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

Elements under outage	1. 220KV/33KV Renew_Surya_Koppal-ICT-2
Weather Condition (मौसम स्थिति)	Normal

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

Generation Loss (MW)		Load Loss (MW)
Solar	1.0 MW	0.0 MW
Wind	0.0 MW	
Others	0.0 MW	
Total	1.0 MW	

Duration of interruption (रुकावट की अवधि): 1 hours, 5 minutes

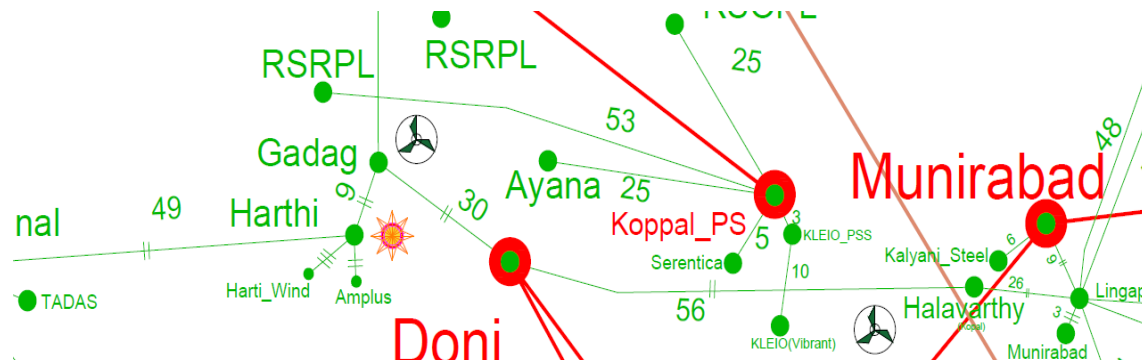
7. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-KOPPAL-Renew_Surya_Koppal-1

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

220kV Renew_Surya_Koppal (RSRPL) is radially connected to Koppal through 220kV Koppal-RSRPL. As per the reports submitted, the triggering incident was tripping of 220kV Koppal-RSRPL line while charging 220KV/33KV Renew_Surya_Koppal-ICT-2 at 220kV Renew_Surya_Koppal on suspected DEF protection. However, the same could not be verified from DR and EL. At the same time DT was sent to Koppal end and the line tripped at both ends. Tripping of the only connected line led to complete outage of 220kV Renew_Surya_Koppal.

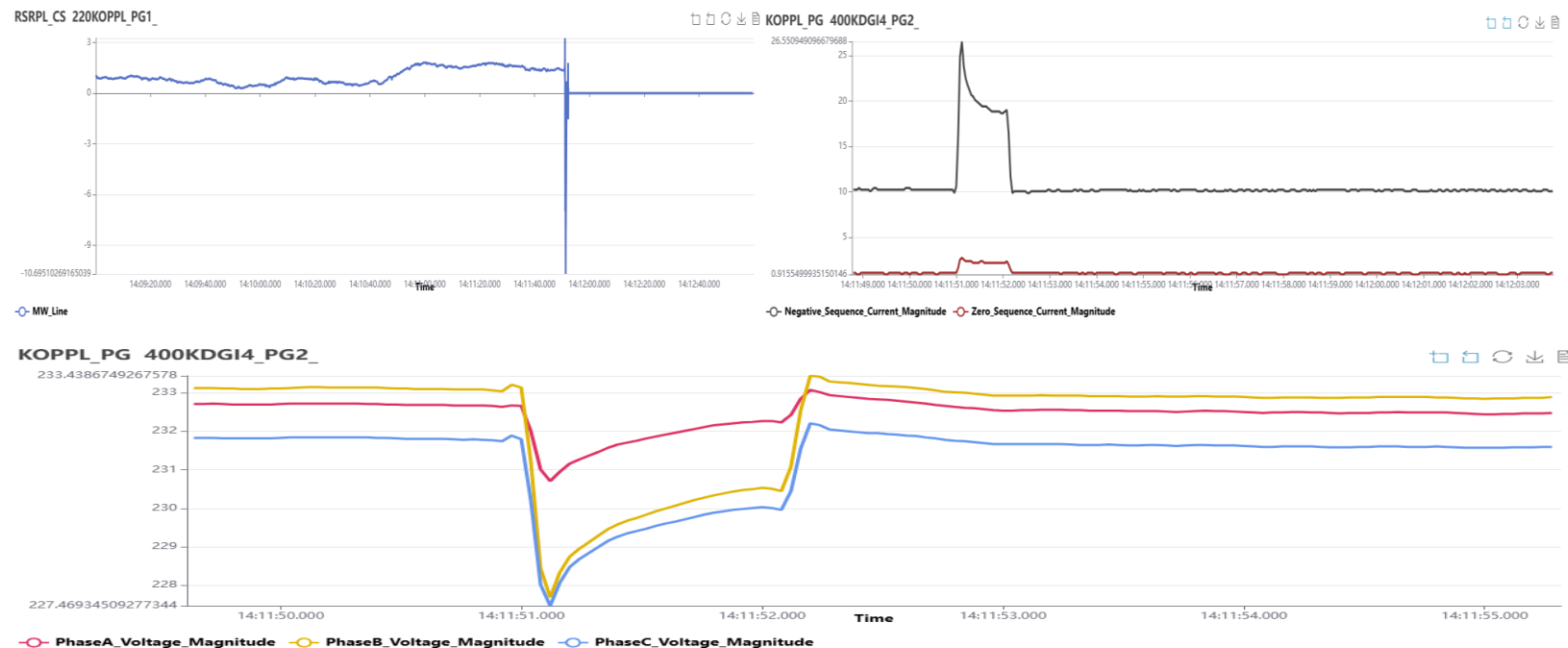


10. DR Analysis:

220KV-KOPPAL-Renew_Surya_Koppal-1

	KOPPAL - 220KV	Renew_Surya_Koppal - 220KV
Time Sync Issue	No	No
DR Analysis	<p>DR Trigger Time:30-03-2026 14:11:51.200 T1 Any Start L18 CR REC CH2, DIST UNB CR L8 DT REC CH1, R7 GRP-A TRIP, R8 GRP-B TRIP L22 GRP A OPTD 3PH GR B OPTD T1 L1 M CB R OPN, L3 M CB B OPN L2 M CB Y OPN Ir (max): 0.13 kA Iy (max): 0.86 kA Ib (max): 0.69 kA Vr (max): 133.60 kV Vy (max): 144.26 kV Vb (max): 129.19 kV DR Trigger Time:30-03-2026 14:11:52.274 L1 DT REC CH1 R9 GRP-A TRIP, R10 GRP-B TRIP L15 86B OPTD, L15 86B OPTD Ir (max): 0.05 kA Iy (max): 0.35 kA Ib (max): 0.27 kA Vr (max): 134.70 kV Vy (max): 144.42 kV Vb (max): 129.99 kV</p>	<p>DR Trigger Time:30-03-2026 14:11:52.233 Any Trip, Trip Output A, Trip Output B, 86.1 Trip Relay, 86.2 Trip Relay, 87L1 Optd To PMU, DT Send CH-2 DT Send CH-1 A/R Block CB B-ph Open Ir (max): 0.07 kA Iy (max): 0.38 kA Ib (max): 0.29 kA Vr (max): 135.28 kV Vy (max): 145.62 kV Vb (max): 129.80 kV</p>

11. A) PMU Analysis:



From the PMU dip in voltages is observed indicating transformer inrush current during the event.

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

Constituent	Points for review
INDIGRID	1. Tripping of 220kV Koppal Renew Surya Koppal line at Renew Surya Koppal line while charging the ICT-2 at Renew Surya Koppal end.

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

Constituent	Remedial Actions

INDIGRID	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-2.
----------	---

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

15. Restoration Details:

220KV-KOPPAL-Renew_Surya_Koppal-1 tripped at 30-03-2026 14:11 and restored at 30-03-2026 15:16

16. 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, RENEW POWER PVT LTD
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	RENEW POWER PVT LTD
4	Any other non-compliance	IEGC section 17.3	

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
30-03-2026 14:11:54	KOPPAL CB 20252 (LINE TO RSN12) OPEN	KOPPL_PG
30-03-2026 14:11:57	ROSHINI SURJA CB 20452 (LINE TO KOPPL) OPEN	RSN12_CS
30-03-2026 14:11:57	ROSHINI SURJA CB 20352 (T2_P) CLOSED	RSN12_CS

Deliberations:

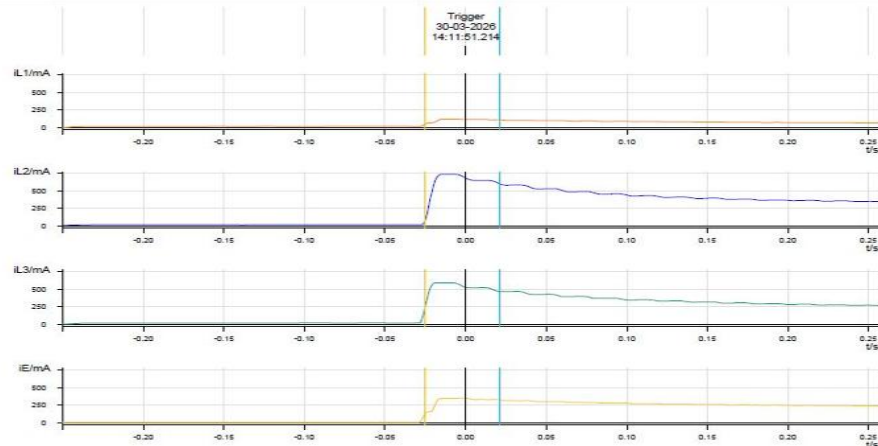
1. M/s Renew stated that 220 kV RSRPL GSS end Bay No. 204 tripped on 30.03.2026 at 14:11:51 hrs.
2. It was informed that during charging of ICT-2 (LV side), 220 kV Line Bay-204 circuit breaker had tripped and Direct Transfer Trip (DTT) was transmitted through Channel-2 to the remote end GSS at Koppal.

Bay-204 DR and Fault current of Event M1(differential) Relay

GATEWAY1\IEC 61850 Client\220_33kV\B204_21(7SA522)

- 2 -

30-03-2026 / 14:11:51.214



SIEMENS					
B204_21(7SA522)_drn_14_28_27					
Indications					
Event Log - 30-03-2026 - RPPL_Hombal SS / 220kV / LINE / B204_21(7SA522)/7SA522					
Event Log - 30-03-2026 - RPPL_Hombal SS / 220kV / LINE / B204_21(7SA522)/7SA522					
Number	Indication	Value	Date and time	Cause	
	Direct Trip Send CH-2	OFF	30.03.2026 14:11:52.347	Spontaneous	
	Main CB-Y-ph Open	ON	30.03.2026 14:11:52.281	Spontaneous	
	Main CB-R-ph Open	ON	30.03.2026 14:11:52.281	Spontaneous	
	Main CB-B-ph Open	ON	30.03.2026 14:11:52.280	Spontaneous	
	AR Block	ON	30.03.2026 14:11:52.255	Spontaneous	
00381	Single-phase trip permitted from ext.AR	OFF	30.03.2026 14:11:52.265	Spontaneous	
	Direct Trip Send CH-2	ON	30.03.2026 14:11:52.239	Spontaneous	
00301	Power System fault	S36 - OFF	30.03.2026 14:11:51.374	Spontaneous	
00301	Power System fault	S36 - ON	30.03.2026 14:11:51.214	Spontaneous	
00301	Power System fault	S34 - OFF	27.03.2026 08:09:45.766	Spontaneous	
00301	Power System fault	S34 - ON	27.03.2026 08:09:45.745	Spontaneous	
01335	Earth fault protection Trip is blocked	OFF	27.03.2026 08:09:45.741	Spontaneous	
00301	Power System fault	S33 - OFF	27.03.2026 08:09:45.625	Spontaneous	
01335	Earth fault protection Trip is blocked	ON	27.03.2026 08:09:45.603	Spontaneous	
00301	Power System fault	S33 - ON	27.03.2026 08:09:45.497	Spontaneous	
00301	Power System fault	S32 - OFF	25.03.2026 16:23:35.930	Spontaneous	
00301	Power System fault	S32 - ON	25.03.2026 16:23:35.889	Spontaneous	
00301	Power System fault	S31 - OFF	23.03.2026 21:19:48.226	Spontaneous	
00301	Power System fault	S31 - ON	23.03.2026 21:18:48.047	Spontaneous	
02783	AR: Auto-reclose is blocked	OFF	19.03.2026 00:03:19.777	Spontaneous	
00590	Line closure detected	OFF	19.03.2026 00:03:19.029	Spontaneous	
	CB Manual Clos	OFF	19.03.2026 00:03:18.853	Spontaneous	
	Main CB-B-ph Open	OFF	19.03.2026 00:03:18.830	Spontaneous	
	Main CB-Y-ph Open	OFF	19.03.2026 00:03:18.830	Spontaneous	
	Main CB-R-ph Open	OFF	19.03.2026 00:03:18.830	Spontaneous	

Page 2 of 17

- Regarding remedial measures taken, M/s Renew informed that post-fault patrolling and inspection of the transmission line and associated PSS/protection systems had been completed and no abnormalities were observed. It was further stated that the incident had occurred due to DTT operation during energisation of ICT-2.
- SRPC enquired regarding the reason for initiation of Direct Transfer Trip. M/s Renew informed that the matter had been referred to the OEM for review of protection settings and reply from the OEM was awaited. Further, with regard to earlier suggestions on review of DEF settings for lines, M/s Renew stated that the settings had been checked and found to be appropriate. However, the matter had also been referred to the OEM for further review and their response was awaited.
- SRPC enquired whether 2nd and 5th harmonic blocking functions for lines and ICTs had been properly ensured. M/s Renew stated that the same would be checked and updated subsequently.
- SRLDC observed that such incidents could occur if earth fault protection is configured as non-directional or if harmonic blocking settings are not properly configured and requested M/s Renew to review the relevant settings thoroughly. SRPC further requested M/s Renew to consult the OEM and submit a detailed report on the incident and findings.

Recommendations:

- M/S Renew to consult the OEM and submit detailed report regarding sending of DT and tripping of line during the event.

S. No	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
10	Complete outage of 220kV RSRPL_GadagPS of Renew	As per the reports submitted, the triggering incident was YB-G fault in 220kV Gadag RSRPL_Gadag_PS line at 205 line bay at RSRPL end. At RSRPL end, the fault was sensed in I>4 over current protection and DT was sent to Gadag end. However, the line tripped only at RSRPL end and the line was holding at Gadag end. Tripping of the only connected line led to complete outage of 220kV RSRPL_GadagPS.	05-04-2026 08:55	10	0	GD - 1	27-04-2026	20-04-2026	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 YB-G fault in 220kV Gadag RSRPL_Gadag_PS line at 205 line bay at RSRPL end. At RSRPL end, the fault was sensed in I>4 non directional over current protection and 3ph tripped. However, the line tripped only at RSRPL end and the line was holding at Gadag end. Tripping of the only connected line led to complete outage of 220kV RSRPL_GadagPS.

2. Time and Date of the Event (घटना का समय और दिनांक: 05-04-2026 08:55)

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)	14608	14642
Karnataka State Generation (MW)	7987	8261
Grid Frequency (Hz)	50.06	50.1

SR Demand (MW)	59454	59544
SR Generation (MW)	48568	48831

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At RSRPL end:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

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

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

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

7. Duration of interruption (रुकावट की अवधि): 1 hours, 18 minutes

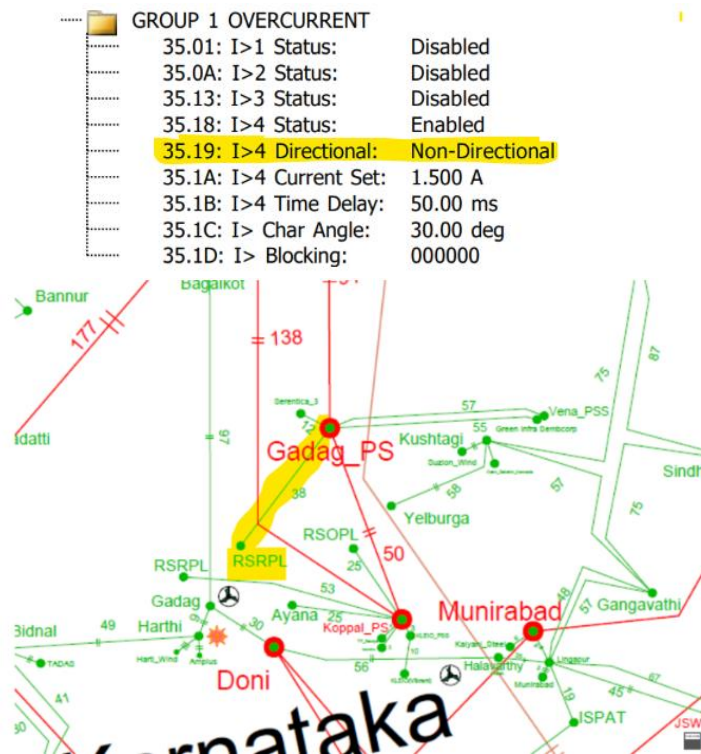
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 220KV-GADAG_PSS-RSRPL_GadagPS-1

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

220kV RSRPL_GadagPS was radially connected to Gadag through 220KV-GADAG_PSS-RSRPL_GadagPS-1. As per the reports submitted, the triggering incident was YB-G fault in 220kV Gadag RSRPL_Gadag_PS line at 205 line bay at RSRPL end (as per FIR) due to foreign object (monkey). At RSRPL end, the fault was sensed in I>4 non directional over current protection in only one Main (Main-1 as shown below) and DT was sent to Gadag end (as per DR).



However, the DT was not received at Gadag end as the line tripped only at RSRPL end and the line was holding at Gadag end. At Gadag end, the fault was not sensed and the line was holding. Tripping of the only connected line to RSRPL_GadagPS led to complete outage of 220kV RSRPL_GadagPS.

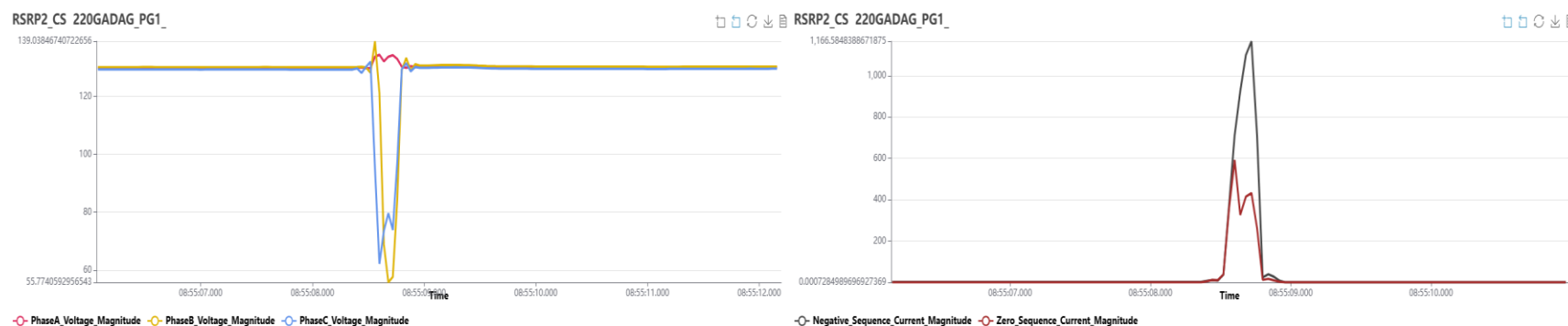
11. DR Analysis:

220KV-GADAG_PSS-RSRPL_GadagPS-1

	GADAG_PSS - 220KV	RSRPL_GadagPS - 220KV
Time Sync Issue	No	No
DR Analysis	Line Holding	DR Trigger Time:05-04-2026 08:55:08.701 Any Trip, I>4 Trip, 86.1 TRIP AR Block CB_R-ph Open, CB_B-ph open, CB_Y-ph Open

		DT Send CH-1 Ir (max): 0.67 kA Iy (max): 3.85 kA Ib (max): 2.74 kA Vr (max): 138.67 kV Vy (max): 140.76 kV Vb (max): 131.53 kV
--	--	---

12. A) PMU Analysis:



From the PMU, dip in Y and B-phases is observed indicating Y-B-G fault during the event with a delayed fault clearance of around 200ms.

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

Constituent	Points for review
RENEW POWER PVT LTD	1. Enabling of over current ($I > 4$) at RSRPL_GadagPS needs review

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

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

16. Restoration Details:

RSRPL_GadagPS - 220KV tripped at 05-04-2026 08:55 and restored at 20-04-2026 18:44

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

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
05-04-2026 08:55:39	ROSHINI SURJA 2 CB 20552 (LINE TO GADAG) OPEN	RSN22_CS

Detailed Draft Report of grid event submitted by RSRPL GadagPS SS:

Detailed Report

Date of Submission : 20-04-2026 19:01

RSRPL_GadagPS - 220KV tripped at **05-04-2026 08:55** and restored at **20-04-2026 18:44**

Summary of Event (घटना का सारांश) : On 5th April 08:55 Hrs Bay 205 tripped due to foreign object electrocuted. Object removed Bay 205 charged successfully on 10:13 Hrs 5th April 2026

Time and Date of the event (घटना का समय और दिनांक) : 05-04-2026 08:55

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : RSRPL_GadagPS - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV/33KV RSRPL_GadagPS-ICT-1	1. 220KV/33KV RSRPL_GadagPS-ICT-2		

Station Connectivity / SLD during antecedent :

Before tripping

Bay 205 ON

Bay 201 ON

Bay 203 ON

Bay 202 ON

Load 10 MW

AFTER TRIPPING

Bay 205 OFF

Bay 201 ON

Bay 203 ON

Bay 202 ON

Weather Conditions : Normal

Elements under outage prior to the event : 1. 220KV-GADAG_PSS-RSRPL_GadagPS-1

Other Information (Antecedent Cnditions) : Foreign object electrocuted near Bay 205. Object removed. Red flags installed surrounding PSS. and Line Bay 205 charged successfully at 05-April 2026 10:13 Hrs

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : LL

phases inv :

Auto Reclosure Operation :

Fault Clearing Time (ms) : None

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
10 MW	10 MW

Duration of interruption :
(रुकावट की अवधि)

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event : 1. 220KV-GADAG_PSS-RSRPL_GadagPS-1

Station Connectivity/SLD during the event : All Bays were in charged condition before Tripping.

After tripping Bay-205 only tripped remaining elements were in ON condition

Analysis of the event : Bay 205 tripped on 5th April 2026 09:55 Hrs. After inspection foreign object observed near Bay 205. Object removed and Line charged successfully at 10: 13 Hrs.

Protection / Operational Issues observed : NIL

Restoration Details : Object removed. Red flags installed and charged successfully on 5th April 2026 at 10:13 HRS

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) : RED FLAGS INSTALLED SOURROUNDING PSS.

Relay/PLCC Operation Details :

Control Panel Anunciation : OCR

Main I Relay Indications : OCR Y & B phase

Main II Relay Indications : Y phase tripped

Other Relay Indications :

PLCC Counter Increment I/T : 0

PLCC Counter Increment D/T : 0

Fault Current Value (kAmp) : 2.76

LA Counter : 0

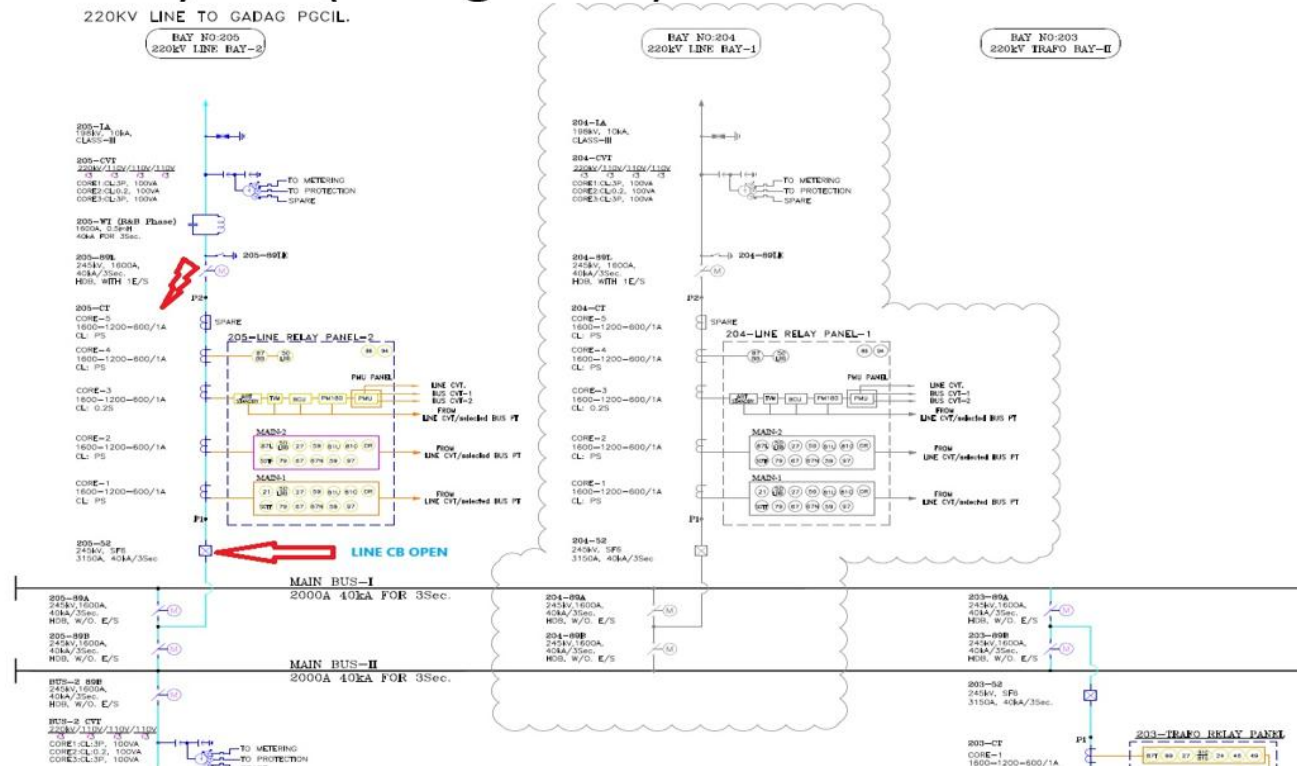
Remarks : Y phase 2.76 kA B phase 2.11 kA

Attachments : 1. [Others](#)

Deliberations:

1. M/s Renew stated that 220 kV Gadag–RSRPL line bay tripped on 05.04.2026 at 08:55:08 hrs. It was informed that Differential Relay (backup protection) had operated with fault currents of IA – 0.30 kA, IB – 2.76 kA and IC – 2.11 kA.
2. M/s Renew further informed that at 08:55:08 hrs, 220 kV EHV Bay-205 had tripped on OCR operation in Y and B phases. During yard inspection, a foreign object was observed electrocuted between the line circuit breaker and Bay-205 line isolator. The foreign object was subsequently removed and the line was charged back at 10:13 hrs.

SLD Bay-205 (Gadag RSRPL)



3. Regarding remedial measures taken, M/s Renew informed that complete yard inspection had been carried out and red flags had been installed throughout the switchyard area of the PSS.
4. SRPC enquired regarding the reason for non-operation of distance protection during the event. M/s Renew stated that the matter had been referred to the OEM and the response was awaited.
5. M/s Renew to submit the OEM report on the incident 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
11	Complete Outage of 230 kV Arani and Echur of TANTRANSCO	The triggering incident is the 110kV Y-ph bus PT failure at Arani (as per FIR) causing 110 kV Bus Fault. Without 110kV BBP, the Bus fault was sensed and the lines tripped on Z3 protection operation at remote ends other than 230KV-ARNI-ECHUR-1. 230KV-MAPS-ECHUR-1 line tripped on DEF protection leading to the Complete Outage of 230 kV Arani and Echur of TANTRANSCO	05-04-2026 23:39	0	231	GD - 1	15-04-2026	08-04-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

The triggering incident is the 110kV Y-ph bus PT failure at Arani (as per FIR) causing 110 kV Bus Fault. Without 110kV BBP, the Bus fault was sensed and the lines tripped on Z3 protection operation at remote ends other than 230KV-ARNI-ECHUR-1. 230KV-MAPS-ECHUR-1 line tripped on DEF protection leading to the Complete Outage of 230 kV Arani and Echur of TANTRANSCO

2. Time and Date of the Event (घटना का समय और दिनांक: 05-04-2026 23:39)

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)	15849	15660
TamilNadu State Generation (MW)	6430	6425
Grid Frequency (Hz)	49.92	49.97
SR Demand (MW)	52763	52574
SR Generation (MW)	45878	45802

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

Bus Configuration at Echur end :

Bus Configuration Type : Single Bus

Bus Coupler Status : NA

Bus 1 Connected Elements
1. 230KV-ARNI-ECHUR-1 2. 230KV-MAPS-ECHUR-1

Bus Configuration at Arani end:

Bus 1 Connected Elements
1. 230KV-ARNI-BHAVANI-1 2. 230KV-ARNI-BHAVANI-2 3. 230KV-ARNI-ECHUR-1 4. 230KV-ARNI-KANCHIPURAM-2 5. 230KV-ARNI-SINGARPET

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	231.0 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):

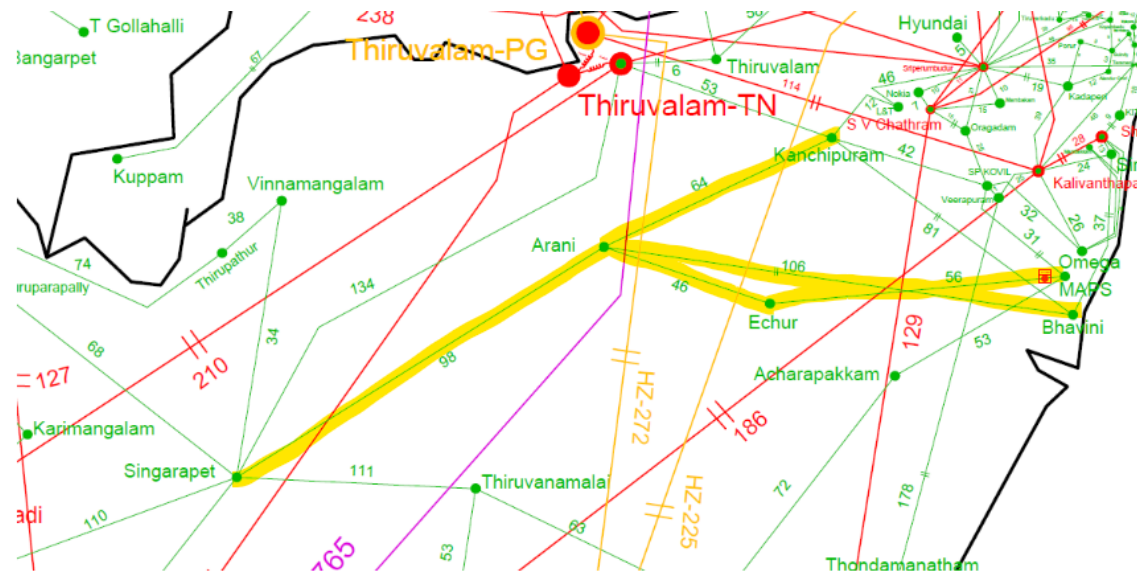
Equipment Type	Equipment make
PT	Details not provided

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

1. 230KV-ARNI-BHAVANI-1
2. 230KV-ARNI-BHAVANI-2
3. 230KV-ARNI-KANCHIPURAM-2
4. 230KV-ARNI-SINGARPET
5. 230KV-MAPS-ECHUR-1

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

230kV Echur is connected to 230kV Arani and MAPS. 230kV Arani is connected to Singarpet, Kanchipuram and Bhavini as shown below.



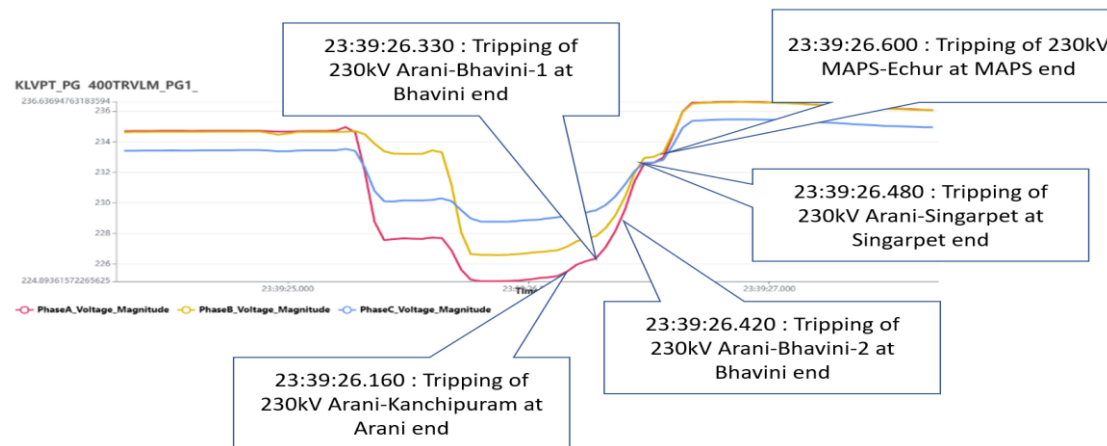
The triggering incident is the 110kV Y-ph bus PT failure at Arani (as per FIR) causing 110 kV Bus Fault. As the BBP protection is not available at 110kV level, the fault was not isolated instantaneously. It can be observed that initially the fault was sensed in R-ph and further developed into R-Y ph fault after around 350ms.



The R-ph fault can be observed from 23:39:35.280 Hrs, and further developed into R-Y fault at around 23:39:35.640. The fault was not isolated by the high set protection of the 230/110kV PTRs and was fed through the connected lines. At remote ends (Kanchipuram, Singarpet) the fault was sensed in Z3. At Kanchipuram end the fault started sensing in Z3, from the fault instance, and tripped after around 850ms at 23:39:26.160 Hrs. At Singarpet end the fault was sensed in Z3 after the fault was developed into R-Y ph fault and tripped after around 850ms in Z3.

Further 230kV Bhavini-Arani-1 line tripped on Z3 protection operation at 23:39:26.330 Hrs and further 230kV Bhavini-Arani-2 line tripped at 23:39:26.420 Hrs in Z3 protection operation after almost 1 sec from the fault initiation.

Thereafter, the only connection to Arani was through 230kV Arani-Echur-MAPS, subsequently 230kV MAPS-Echur line tripped at 23:39:26.600 on DEF protection operation, which was set for 100mA Time delay- 1.2 sec CTR-600/1A, isolating the fault. This led to the complete outage of 230 kV Arani and Echur of TANTRANSCO. The complete tripping sequence is as below:



11. DR Analysis:

ECHUR - 230KV

	ECHUR - 230KV
Time Sync Issue	No
DR Analysis	No DR uploaded

ARNI - 230KV

	ARNI - 230KV
Time Sync Issue	No
DR Analysis	No DR uploaded

230KV-ARNI-BHAVANI-1

	ARNI - 230KV	BHAVANI - 230KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded. Line Holding	DR Trigger Time:05-04-2026 23:39:25.350 DIST : Starting Z< A, MAIN : General starting, MAIN : Starting A, MAIN : Starting GF, DIST : Zero- sequ. starting, DIST : General starting, DIST : Start. switch. to PG, FT_RC: Record. trig. active, FT_RC: System disturb. runn, FT_RC: Record. in progress, DIST : Starting Z< DIST : Zone 1.ze starting, DIST :

		<p>Zone 1 starting, DIST : Zone 2 starting, DIST : Zone 3 starting, DIST : Zone 4 starting, DIST : Zone 5 starting, DIST : Zone 6 starting, DIST : Zone 7 starting, DIST : Zone 8 starting</p> <p>DIST : tVmemory running, DIST : Fault forwd. / LS. A, DIST : Fault forward / LS, DIST : Dir.using Vmeas Sys1, DIST : t1 elapsed</p> <p>DTOC : Starting IN></p> <p>GFSC : IN> triggered</p> <p>PSB : IN> triggered</p> <p>DIST : t2 elapsed</p> <p>DIST : Starting Z< B, MAIN : Starting B</p> <p>DIST : Fault forwd. / LS. B, DIST : Dir.using Vmeas Sys2, DIST : Dir.using Vmeas Sys3</p> <p>DIST : t3 elapsed</p> <p>DIST : Starting I>> A</p> <p>V<> : Starting V<, V<> : Starting V</<< A(-B), V<> : Starting V<<<</p> <p>DIST : Starting I>> B</p> <p>DIST : Trip signal zone 3, DIST : Trip sig. zone 2-8, DIST : Trip signal</p> <p>MAIN : Send transfer trip A, MAIN : Send transfer trip B, MAIN : Send transfer trip C, MAIN : Trip signal 1. 3p, MAIN : Gen. trip command 1, MAIN : Gen. trip signal 1, MAIN : Trip signal 1. A, MAIN : Trip signal 1. B, MAIN : Trip signal 1. C, MAIN : Gen. trip command, MAIN : Trip</p>
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		command 1. A, MAIN : Trip command 1. B, MAIN : Trip command 1. C, LOGIC: Output 4, LOGIC: Output 7, LOGIC: Output 11, LOGIC: Output 12, LOGIC: Output 13 LOGIC: Output 1, LOGIC: Output 2, LOGIC: Output 6, LOGIC: Output 9 DIST : t4 elapsed V<> : Starting V</<< B(-C), V<> : Starting V</<< C(-A), V<> : Starting V< 3-pole, DTOC : Fault N forward V<> : Starting Vpos<, V<> : Starting Vpos<< DIST : Start. switch. to PG DIST : Zero-sequ. starting Ir (max): 0.88 kA Iy (max): 0.77 kA Ib (max): 0.30 kA Vr (max): 132.81 kV Vy (max): 133.26 kV Vb (max): 132.64 kV
--	--	--

230KV-ARNI-KANCHIPURAM-2

	ARNI - 230KV	KANCHIPURAM - 230KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded. Line Holding	DR Trigger Time:05-04-2026 23:39:24.967 T1 Any Start, T1, IN>1 Start IN>1 Timer Block Z3 A/R Trip 3P, A/R Lockout Any Trip, DIST Trip A, DIST Trip

		B, DIST Trip C, AR Lockout Shot> BLK AR(3PH.TRIP) CB Aux A, CB Aux B, CB Aux C, MCB-RPH OPEN, MCB-YPH OPEN, MCB-BPH OPEN Any Pole Dead, All Pole Dead Ir (max): 1.52 kA Iy (max): 1.34 kA Ib (max): 0.61 kA Vr (max): 134.58 kV Vy (max): 135.53 kV Vb (max): 135.79 kV
--	--	--

230KV-ARNI-BHAVANI-2

	ARNI - 230KV	BHAVANI - 230KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded. Line Holding	DR Trigger Time:05-04-2026 23:39:26.397 L6 A/R L/O L10 C PH A/R INI Any Trip C Any Trip B, R16 A/R L/O ANN, L9 B PH A/R INIT Any Trip A, L8 A PH A/R INIT L1 R PH OPEN, L2 Y PH OPEN, L3 B PH OPEN Ir (max): 1.09 kA Iy (max): 1.00 kA Ib (max): 0.41 kA Vr (max): 110.68 kV Vy (max): 115.40 kV Vb (max): 128.05 kV

230KV-ARNI-SINGARPET

	ARNI - 230KV	SINGARPET - 230KV
Time Sync Issue	No	Yes
DR Analysis	No DR uploaded. Line Holding	DR Trigger Time:05-04-2026 23:39:20.147 Any Start DIST Fwd DIST Fwd Z3 AR INITIA B PH AR INITIA R PH, AR INITIA Y PH AR BLOCK Any Trip Any Pole Dead, All Pole Dead Ir (max): 1.70 kA Iy (max): 1.48 kA Ib (max): 0.67 kA Vr (max): 132.26 kV Vy (max): 132.98 kV Vb (max): 131.92 kV

230KV-ARNI-ECHUR-1

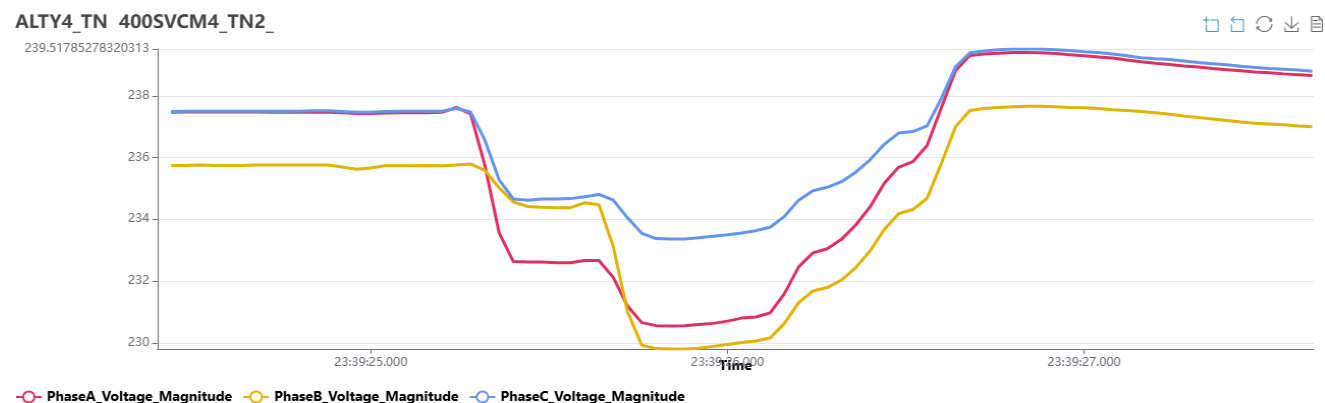
	ARNI - 230KV	ECHUR - 230KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded. Line Holding	No DR uploaded. Line Holding

230KV-MAPS-ECHUR-1

	MAPS - 230KV	ECHUR - 230KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:05-04-2026 23:39:26.553 Any Trip	No DR uploaded. Line Holding

	Ir (max): 1.67 kA Iy (max): 1.48 kA Ib (max): 1.04 kA Vr (max): 120.34 kV Vy (max): 131.08 kV Vb (max): 128.52 kV	
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12. A) PMU Analysis:



From the PMU plot initial R-ph fault can be observed and further developed into R-Y fault with delayed fault clearance of around 1.2s

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

Constituent	Points for review
TANTRANSCO	1. Non operation of ICT highset protection needs review 2. Single bus operation at 230kV ARNI (Single main and transfer) and ECHUR needs review 3. Non operation of Z3 for 230KV-ARNI-ECHUR-1 at ECHUR end needs review
NPCIL_MAPS	1. Enabling of DEF DT needs review

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

Constituent	Remedial Actions
TANTRANSCO	1. Zone-3 setting to be reviewed at remote ends.

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

230kV Arani- Kancheepuram: 06-04-2026 at 00:19hrs

230kV Arani- Singarapet: 06-04-2026 at 00:27hrs

230kV Arani- Echur: 06-04-2026 at 00:40 hrs

230kV Arani- Bhavini1: 06-04-2026 at 01:33hrs

230kV Arani- Bhavini.2: 06-04-2026 at 01:45hrs

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

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

time	Event	Location
05-04-2026 23:39:31	KALPAKKAM CB 20552 (LINE TO ECU2) OPEN	KLPKM_CS
05-04-2026 23:39:40	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) OPEN	KNJI2_TN
05-04-2026 23:40:14	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) CLOSED	KNJI2_TN
05-04-2026 23:40:16	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) OPEN	KNJI2_TN
05-04-2026 23:40:36	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) CLOSED	KNJI2_TN
05-04-2026 23:40:42	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) OPEN	KNJI2_TN
05-04-2026 23:41:39	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) CLOSED	KNJI2_TN
05-04-2026 23:41:47	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) OPEN	KNJI2_TN
05-04-2026 23:44:45	KANCHIPURAM 230 CB 20852 (LINE TO ARNI2) CLOSED	KNJI2_TN

Detailed Draft Report of grid event submitted by ARNI SS:

Detailed Report

Date of Submission : 08-04-2026 12:48

ARNI - 230KV tripped at 05-04-2026 23:39 and restored at 06-04-2026 00:19

Summary of Event (घटना का सारांश) : For a fault in 110kV side, 230kV source feeders tripped at remote end with zone.3 indication Hence source failure at 230kV side.

Since all 110kV feeders were radially fed from Arani 230kV SS hence 110kV side also source failure.

Time and Date of the event (घटना का समय और दिनांक) : 05-04-2026 23:39

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : ARNI - 230KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type :

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 230KV-ARNI-BHAVANI-1			

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
2. 230KV-ARNI-BHAVANI-2 3. 230KV-ARNI-ECHUR-1 4. 230KV-ARNI-KANCHIPURAM-2 5. 230KV-ARNI-SINGARPET			

Station Connectivity / SLD during antecedent :

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) : All 230kV Breakers are holding at Arani 230kV SS

Renewable Energy Trip : False

Details of SPS Operation (if any): False

Reason of tripping : Others

Other Reason : 110kV Capacitor Bank Bus PT failed in Y-Phase and caused damages to adjacent R & B phase PTs along with damages to strung Bus R & Y phases. Since 110kV Busbar protection scheme is not available all the 230kV feeders are tripped from remote end with zone-3 time

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment :
Failure (if any during the event):

Equipment Type	Equipment Make
PT	Name Plate not visible

List of elements tripped during the event :

1. 230KV-ARNI-BHAVANI-1
2. 230KV-ARNI-BHAVANI-2
3. 230KV-ARNI-KANCHIPURAM-2
4. 230KV-ARNI-SINGARPET
5. 230KV-ARNI-ECHUR-1

Station Connectivity/SLD during the event :

Analysis of the event :

1. Y-Phase PT of 110kV Capacitor Bank Bus PT was failed which causes all the 230kV Feeders tripping at respective remote ends with Zone-3 timing.
2. All 230kV & 110kV Breakers were found holding & hand tripped by the duty operator at Arani SS.
3. The faulty 110kV Bus section was isolated.
4. 230kV Feeders and Transformer HV & LV Breakers and 110kV Feeders are charged one by one and supply normalised to all the feeders.

Protection / Operational Issues observed :

110kV Busbar protection has to be ensured

Restoration Details :

230kV Kancheepuram:06-04-2026 at 00:19hrs
230kV Singarapet:06-04-2026 at 00:27hrs
230kV Echur : 06-04-2026 at 00:40 hrs
230kV Bhavini.1 :06-04-2026 at 01:33hrs

230kV Bhavini.2:06-04-2026 at 01:45hrs

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) :

False

Remedial Measures Taken (सुधारात्मक सुझाव) :

Faulty bus section isolated

Relay/PLCC Operation Details :

Control Panel Anunciation :

Bus PT Fail (intended for Capacitor bank)

Main I Relay Indications :

Nil

Main II Relay Indications :

Nil

Other Relay Indications :

Nil

PLCC Counter Increment I/T :

PLCC Counter Increment D/T :

Fault Current Value (kAmp) :

None

LA Counter :

Remarks :

Attachments :

Detailed Draft Report of grid event submitted by ECHUR SS:

Detailed Report

Date of Submission : 08-04-2026 13:19

ECHUR - 230KV tripped at 05-04-2026 23:39 and restored at 06-04-2026 00:40

Summary of Event (घटना का सारांश) : Echur 230kVSS is having two source one is from Maps & other source is from Arani 230kVSS.

During the incident, Arani source failure due to 110kV Y phase Bus PT failed & hence all 230kV source feeder of Arani 230kVSS got tripped

During that time 230kV Maps feeder of Echur 230kVSS also tripped hence source failure observed

Time and Date of the event (घटना का समय और दिनांक) : 05-04-2026 23:39

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : ECHUR - 230KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Single Bus

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 230KV-ARNI-ECHUR-1 2. 230KV-MAPS-ECHUR-1			

Station Connectivity / SLD during antecedent :

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) : At Echur 230kV SS all 230kV source feeder breakers as well as all 110 kV bays breakers are holding

Renewable Energy Trip : False

Details of SPS Operation (if any): False

Reason of tripping : Others

Other Reason : Source failure

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event):

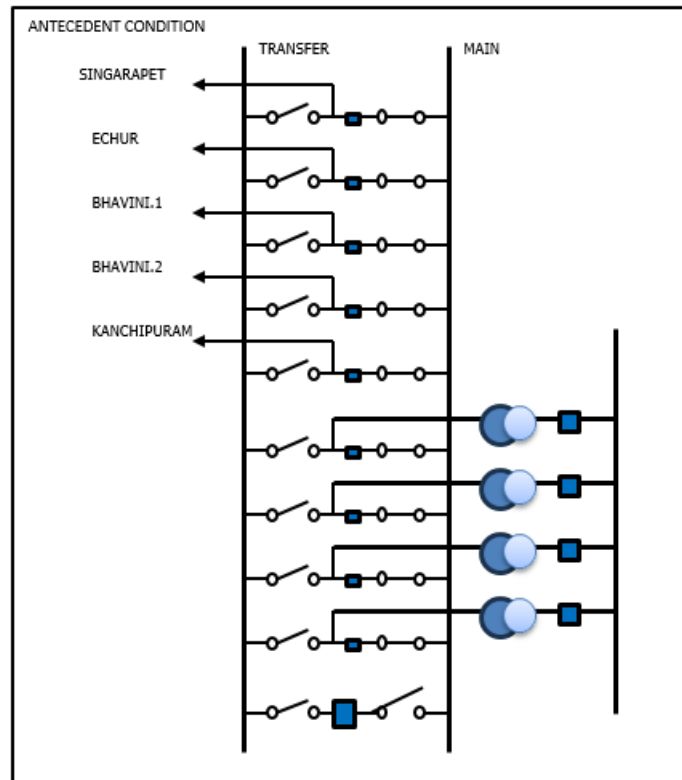
Equipment Type	Equipment Make
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List of elements tripped during the event	:	1. 230KV-MAPS-ECHUR-1
Station Connectivity/SLD during the event	:	
Analysis of the event	:	<p>On 05.04.2026 at 11.39 hrs., at Echur 230kV SS, 230kV Arani feeder supply failed due to 110kV bus PT (Y-Phase) failure at Arani 230kV SS. Subsequently Echur 230kV SS become radial from Kalpakkam.</p> <p>Simultaneously 230kV Kalpakkam feeder supply failed due to feeder Distance Protection operated (A, B(y), C, 52.9 kM, fault duration - 900ms, fault impedance - 2.23 ohms) at Kalpakkam end and hence at Echur 230kV SS total supply failure occurred.</p> <p>At Echur 230kV SS, all 230kV source feeder breakers as well as all 110kV bays breakers are holding.</p> <p>On 06.04.2026, at about 00.40 hrs., Echur SS availed 230kV Supply from Arani 230kV SS.</p> <p>On 06.04.2026 at about 00.55 hrs., after got the SRLDC code, 230kV Kalpakkam feeder charged from Echur end and tied at Kalpakkam end at about 01.17 hrs. on 06.04.2026.</p>
Protection / Operational Issues observed	:	NIL
Restoration Details	:	
DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	NIL
Relay/PLCC Operation Details	:	

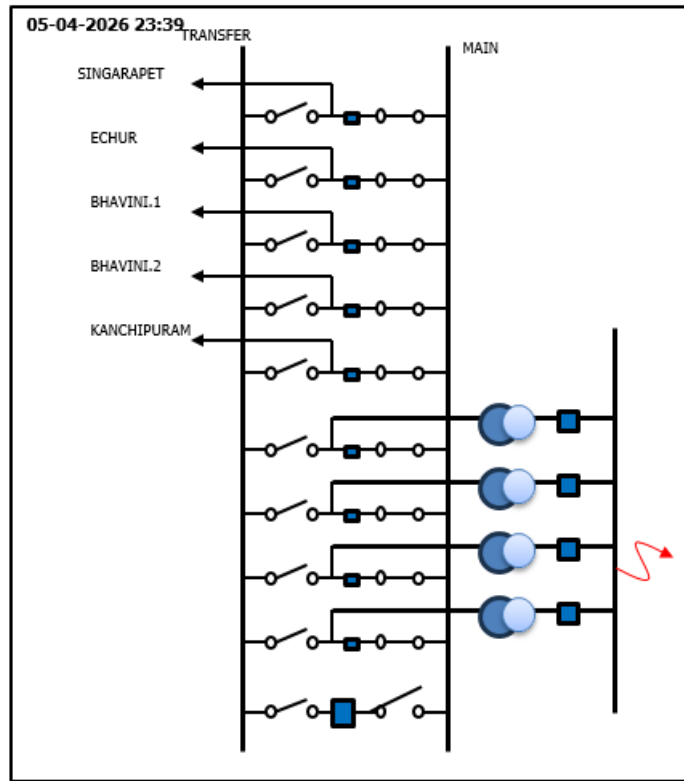
Control Panel Anunciation	:	
Main I Relay Indications	:	
Main II Relay Indications	:	
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	
Attachments	:	

Deliberations:

1. TANTRANSCO stated that, under antecedent conditions, Arani 230 kV Substation was operating with single main and transfer bus scheme. It was informed that five 230 kV feeders, namely Singarapet, Echur, Bhavini-1, Bhavini-2 and Kanchipuram feeders, along with four numbers of 230/110 kV Auto Transformers, were operating in parallel.



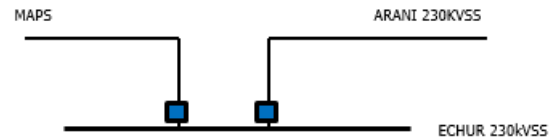
2. TANTRANSCO informed that on 05.04.2026 at 23:39 hrs, Y-phase 110 kV Bus PT had failed, which subsequently damaged the R and B phase Bus PTs also.



3. TANTRANSCO confirmed non-availability of 110 kV busbar protection at Arani Substation and consequently the fault was cleared by the 230 kV source feeders under Zone-3 protection operation.
4. TANTRANSCO informed that Zone-3 settings at Singarapet, Echur and Kanchipuram ends were reviewed. It was observed that the existing Zone-3 settings, configured as 100% of protected line plus 110% of the longest line, had encroached into the 110 kV level due to all four transformers operating in parallel condition.
5. Regarding remedial measures taken, TANTRANSCO informed that Zone-3 settings at Kanchipuram, Singarapet and Echur ends had been restricted to 75% of transformer equivalent impedance in accordance with TANTRANSCO protection philosophy. It was further informed that 110 kV busbar protection would be provided at Arani 230 kV Substation.
6. SRPC enquired regarding non-operation of ICT overcurrent protection. TANTRANSCO stated that the fault current was around 6600 A and the same had been distributed among the four ICTs. As per the existing settings, ICT protection would have operated in around 1.4 seconds; however, before operation of ICT protection, the remote end lines had already tripped under Zone-3 protection. TANTRANSCO further informed that the Zone-3 settings of remote end feeders were also being reviewed.

7. TANTRANSCO further informed that Echur 230 kV Substation was operating with single bus configuration having two source feeds, one from MAPS and the other from Arani 230 kV Substation. During the incident, breakers at Echur end were found healthy and holding. It was informed that DEF protection operated at MAPS end and all source feeders from Arani end had tripped, resulting in bus dead condition due to source failure.

Echur 230kVSS



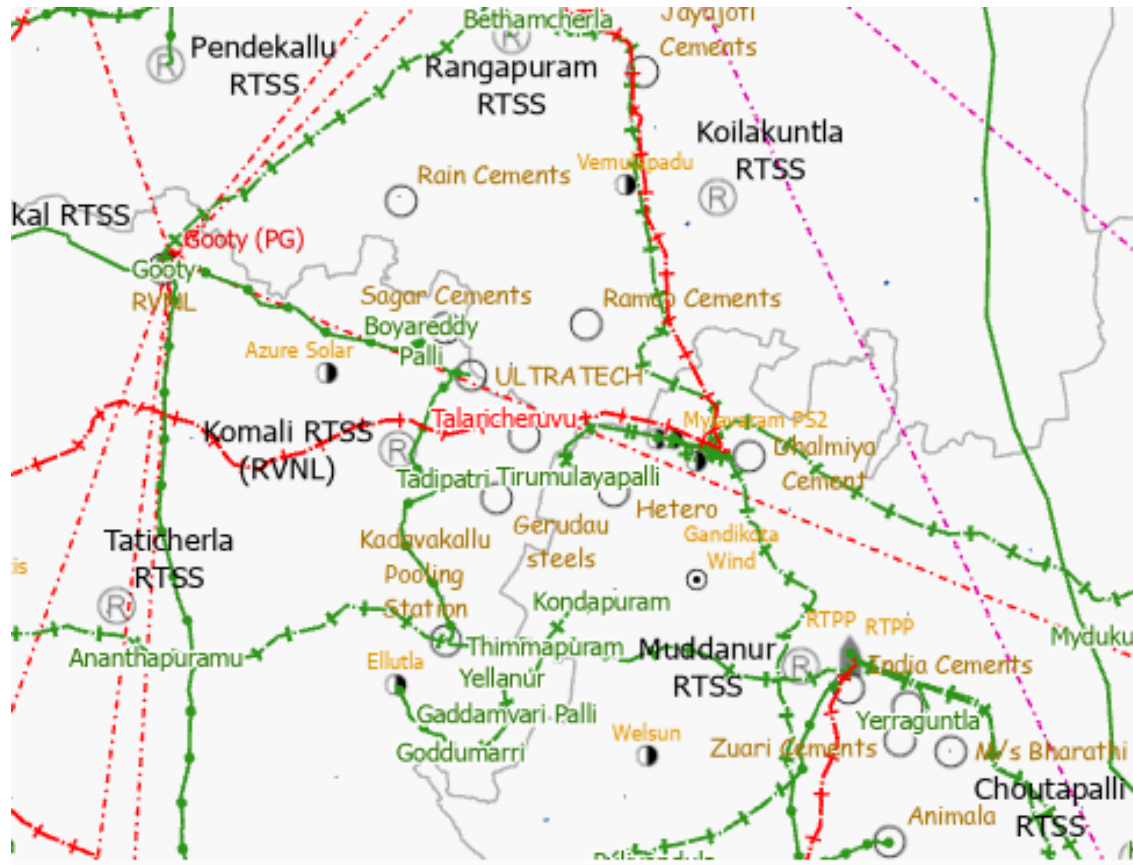
8. SRPC enquired regarding non-operation of distance protection at Echur end. TANTRANSCO stated that Zone-3 start signal had been observed at Echur end; however, before operation of protection at Echur end, MAPS end had already tripped under DEF protection. SRPC highlighted possible relay coordination issues between NPCIL-MAPS and Echur ends and requested TANTRANSCO and NPCIL-MAPS to review the coordination between Distance and DEF protections for the line relays and submit a detailed study report to SRPC and SRLDC.
9. SRPC highlighted DR time synchronisation issue observed at Singarapet end. TANTRANSCO stated that there was no DR time synchronisation issue as per their observations; however, the same would be verified once again with field personnel and the status would be updated subsequently.

Recommendations:

- ✚ TANTRANSCO to review the remote end Zone-3 settings of lines connecting to 230kV Arani SS.
- ✚ TANTRANSCO & NPCIL –MAPS to review the distance and DEF coordination and submit report to SRPC & SRLDC.
- ✚ TANTRANSCO to implement 110kV BUSBAR protection at 230kV Arani 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
12	Complete Outage of 220kVTadipathri	During antecedent conditions, 220kV Tadipathri Boyareddypalli line was under LC. 220kV Tadipathri SS was being fed through 132kV network through 132kV Tadipathri Kondapuram and 132kV Gooty RS-Gudipadu-Ankireddypalli-Komali- Tadipatri feeders. As per the reports submitted, at 14:56hrs, 132kV Tadipathri Ankireddypalli line tripped on R-G fault. Subsequently, 132kV Ankireddypalli Gudipadu feeder tripped on non directional over current protection at Ankireddypalli end. Tripping of both sources led to complete outage of 220kV Tadipathri SS.	10-04-2026 14:56	27	97	GD - 1	22-04-2026	16-04-2026	Considered

SLD of the affected Sub-station/Connectivity Diagram:



Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

During antecedent conditions, 220kV Tadipathri Boareddypalli line was under LC. 220kV Tadipathri SS was being fed through 132kV network through 132kV Tadipathri Kondapuram and 132kV Gooty RS-Gudipadu-Ankireddypalli-Komali- Tadipatri feeders. As per the reports submitted, at 14:56hrs, 132kV Tadipathri Ankireddypalli line tripped on R-G fault. Subsequently, 132kV Ankireddypalli Gudipadu feeder tripped on non directional over current protection at Ankireddypalli end. Tripping of both sources led to complete outage of 220kV Tadipathri SS.

2. Time and Date of the Event (घटना का समय और दिनांक): 10-04-2026 14:56

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)	13504	13466
Andhra Pradesh State Generation (MW)	7695	7710
Grid Frequency (Hz)	49.98	49.95
SR Demand (MW)	73991	74132
SR Generation (MW)	54978	55037

**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)
27.0 MW	97.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 14 minutes**8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण):** NA**9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)****10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):**

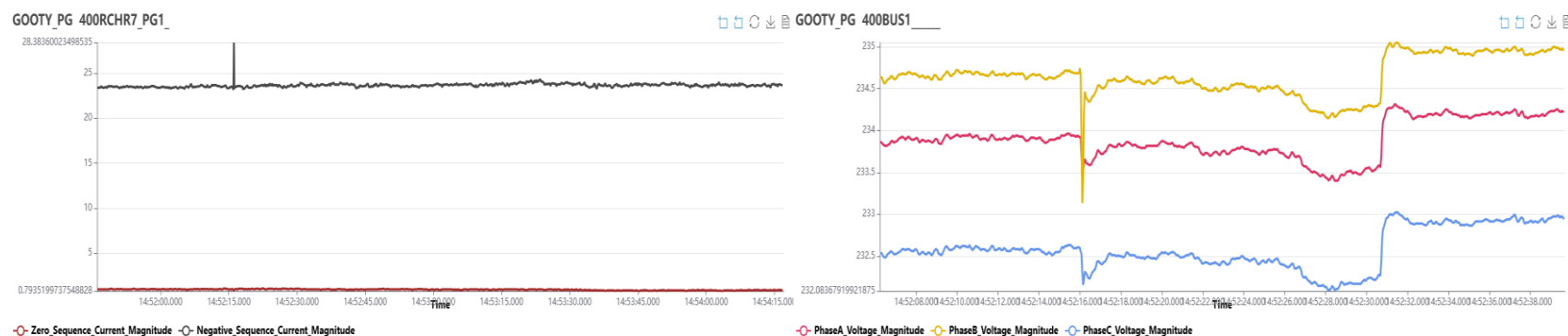
During antecedent conditions, 220kV Tadipathri Boyareddypalli line was under LC. 220kV Tadipathri SS, 132kV Komatikuntla, 132kV RTSS Komali, 132kV Ankireddypalli SS and 132kV Penna cements were being fed through 132kV network through 132kV Tadipathri Kondapuram and 132kV Gooty RS-Gudipadu-Ankireddypalli-Komali- Tadipatri feeders. As per the reports submitted, at 14:56hrs, the triggering incident was Y-G fault in 132kV Tadipathri Kondapuram line. At Tadipathri end, this fault was sensed as Y-G fault in zone-1. At Kondapuram end, this fault was sensed as R-G fault in zone-1 and the line tripped. Subsequently, the 132 kV Ankireddypalli-Gudipadu feeder tripped on non-directional overcurrent protection, which had been inadvertently enabled at the Ankireddypalli end. However, the same could not be verified due to non availability of DR. Tripping of both sources led to complete outage of 220kV Tadipathri SS, 132kV Komatikuntla, 132kV RTSS Komali, 132kV Ankireddypalli SS and 132kV Penna cements.

TADIPATHRI - 220KV

	TADIPATHRI - 220KV
Time Sync Issue	Yes
DR Analysis	132kV Tadipatri Kondapuram at Tadipatri end: DR Trigger Time:10-04-0026 14:21:02.226 FIDEN, 50GF, 32QGE, 32QE FSA, 32QF, 32GF, F32Q, F32QG *, 50ABC, X5ABC, X6ABC Z4G, XAG4 Z2G, Z3G, XAG2, XAG3

	TRP, A, G, ZONE1, Z1G, Z1GT, Z1T, TRIP, OUT107, OUT104, OUT103, OUT102, OUT101, XAG1 Ir (max): 3.26 kA Iy (max): 0.37 kA Ib (max): 0.49 kA 132kV Tadipatri Kondapuram at Kondapuram end: DR Trigger Time:10-04-2026 14:35:16.778 50GF, 50GR FIDEN, 32QGE, 32QE 32QF, 32GF, F32Q, F32QG FSB Z3G, Z4G, XBG3, XBG4 Z2G, XBG2 TRP, B, G, ZONE1, Z1G, Z1GT, Z1T, TRIP, OUT107, OUT104, OUT103, OUT102, OUT101, XBG1
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12. A) PMU Analysis:



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

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

Constituent	Points for review
APTRANSCO	1. Tripping of 132kV Ankireddypalli Gudipadu on over current protection. 2. Non furnishing of DR of 132kV Ankireddypalli Gudipadu line.

	3. DR time sync issue in 132kV Tadipathri Kondapuram line. 4. Fault in 132kV Tadipathri Kondapuram line is seen as R-G fault at Kodapuram end and Y-G fault at Tadipathri end.
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14. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

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

16. Restoration Details:

TADIPATHRI - 220KV tripped at 10-04-2026 14:56 and restored at 10-04-2026 15:10

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	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
10-04-2026 14:52:22	TADIPATHRI CB 10952 (T3_P) OPEN	TDPT2_AT

Detailed Report

Date of Submission : 16-04-2026 17:25

TADIPATHRI - 220KV tripped at 10-04-2026 14:56 and restored at 10-04-2026 15:10

Summary of Event (घटना का सारांश) : During the LC period of 220kV Boyraredhypalli-Tadipatri feeder, while loads were being fed from 220kV Kondapuram SS and 220kV Gooty RS through 132kV network, tripping of connected 132kV feeders in the above 132kV network one after the other resulted in interruption of power supply to 220kV Tadipatri, 132kV Komatikunta, 132kV RTSS Komali, 132kV Ankireddypalli SS and 132kV Penna cements.

Time and Date of the event (घटना का समय और दिनांक) : 10-04-2026 14:56

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : TADIPATHRI - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :
Bus Configuration Type : Single Bus
Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements

Station Connectivity / SLD during antecedent :
Weather Conditions : Normal
Elements under outage prior to the event :
Other Information (Antecedent Cnditions) :
Renewable Energy Trip : False
Details of SPS Operation (if any): : False
Reason of tripping :
Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption (रुकावट की अवधि) :
Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
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List of elements tripped during the event : 1.

Analysis of the event :

Antecedent condition:

On 10/04/2026 at 10:28 Hrs. LC availed on 220kV Boyareddypalli-Tadipatri feeder for replacement of CTs at 220kV Boyareddypalli SS. In this condition, 220kV Tadipatri loads were fed from

220kV Kondapuram SS through 132kV Kondapuram-Tadipatri feeder

220kV Gooty RS through the path: 132kV Gooty RS-Gudipadu-Ankireddypalli-RTSS Komali- Tadipatri feeders.

Triggering incident:

At 14:56 Hrs. Fault occurred in 132kV Tadipatri-Kondapuram feeder and hence the following protection were operated at both the ends.

At Tadipatri end: (SEL311C): Zone-1, Y-Ph, Fault current: 1.7kA, Fault location: 19.07kM

At Kondapuram end: (SEL311C): Zone-1, R-Ph.

Incident that resulted in complete outage of subject substations:

After tripping of 132kV Tadipatri-Kondapuram feeder, all the loads of 220kV Tadipatri, 132kV Komatikuntla, 132kV RTSS Komali, 132kV Ankireddypalli SS and 132kV Penna cements were fed by 220kV Gooty RS (through 132kV Gooty RS-Gudipadu-Ankireddypalli-Komali-Tadipatri feeders).

In this condition at 14:56 Hrs., 132kV Ankireddypalli-Gudipadu feeder was tripped at Ankireddypalli end unwarrantedly due to operation of

Non-directional over current protection enabled in ABB make REX521 type relay.

Hence, complete outage of 220kV Tadipatri SS, 132kV Ankireddypalli, 132kV Komatikuntla and 132kV RTSS Komali occurred due to tripping of only feeder connected to only source feeding the loads by that time.

Load & Generation loss:

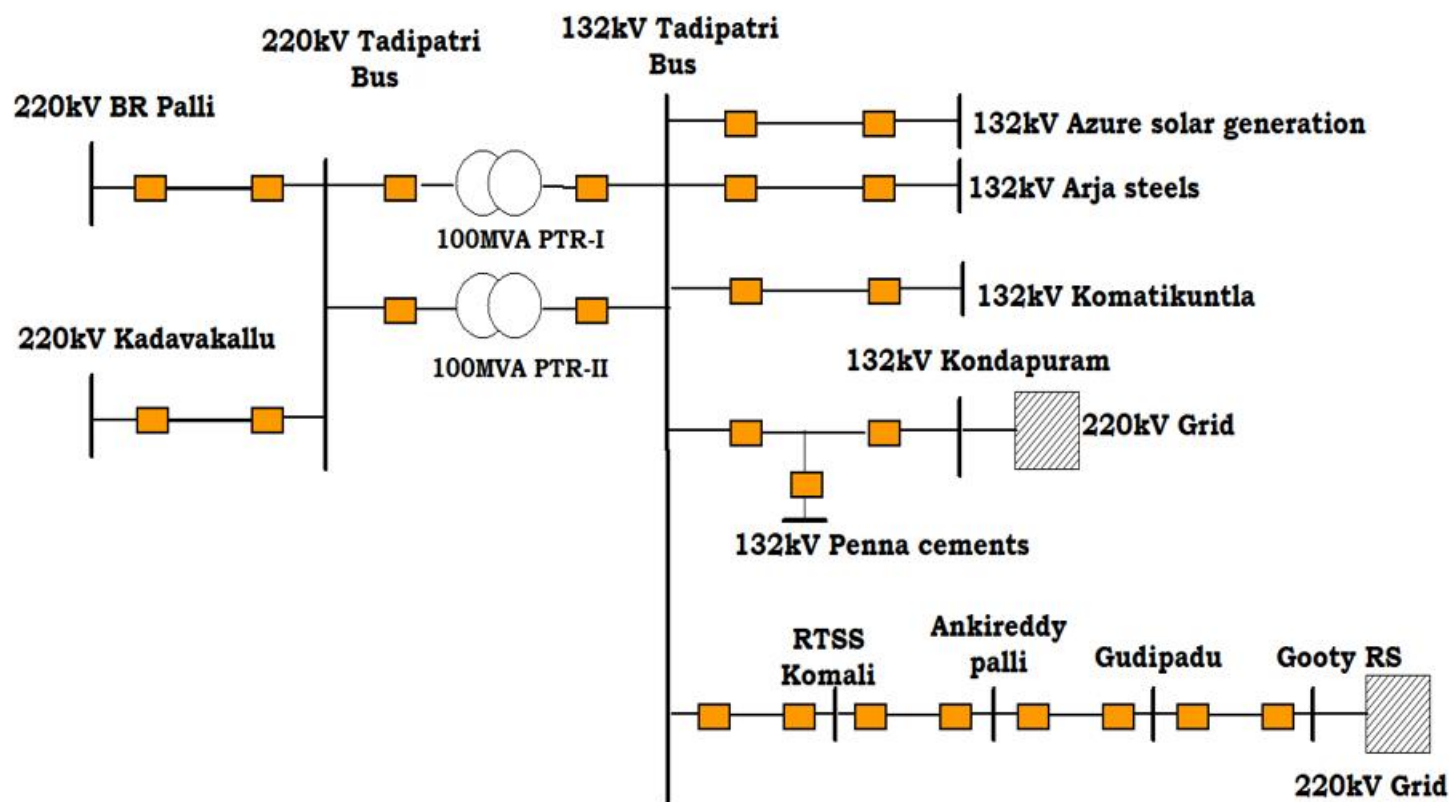
Load loss : 97 MW

Generation loss: 26.6MW

Protection / Operational Issues observed :	On 15/04/2026, an unwarranted element in overcurrent function that was enabled at Ankireddypalli end was disabled.
Restoration Details :	220kV Boyareddypalli-Tadipatri feeder charged at BR Palli end at 15:08 Hrs and at Tadipatri end on 15:10 Hrs respectively. 132kV Tadipatri-Kondapuram feeder was test charged at 15:22 Hrs and stood OK.
DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या) :	False
Remedial Measures Taken (सुधारामक सुझाव) :	
Relay/PLCC Operation Details :	
Control Panel Anunciation :	132kV Tadipatri-Kondapuram feeder: At Tadipatri end: (SEL311C): Zone-1, Y-Ph, Fault current: 1.7kA, Fault location: 19.07kM At Kondapuram end: (SEL311C): Zone-1, 132kV Ankireddypalli-Gudipadu feeder at Ankireddypalli end: OC operated.
Main I Relay Indications :	
Main II Relay Indications :	
Other Relay Indications :	
PLCC Counter Increment I/T :	
PLCC Counter Increment D/T :	
Fault Current Value (kAmp) :	None
LA Counter :	
Remarks :	
Attachments :	

Deliberations:

1. APTRANSCO stated that the antecedent conditions, on 10.04.2026 at 10:28 hrs, were with line clearance availed on 220 kV Boyareddypalli–Tadipathri feeder for replacement of CTs at 220 kV Boyareddypalli Substation. During this condition, the loads of 220 kV Tadipathri Substation were being fed from 220 kV Kondapuram Substation through 132 kV Kondapuram–Tadipathri feeder and from 220 kV Gooty RS through the path comprising 132 kV Gooty RS–Gudipadu–Ankireddypalli–RTSS Komali–Tadipathri feeders.

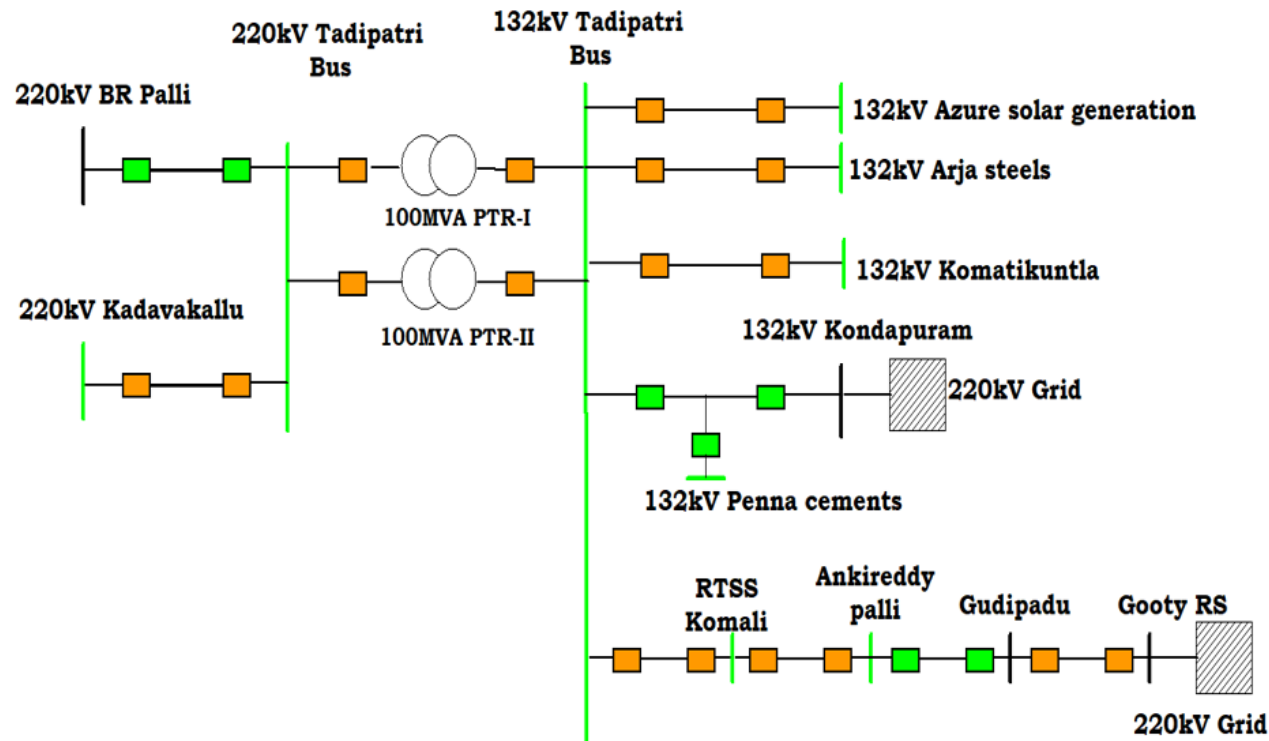


2. APTRANSCO stated that at 14:56 Hrs. fault occurred in 132kV Tadipathri - Kondapuram feeder and hence the following protection were operated at both the ends.
 - a. At Tadipathri end: (SEL311C): Zone-1, Y-Ph, Fault current: 1.7kA, Fault location: 19.07kA.
 - b. At Kondapuram end: (SEL311C): Zone-1, R-Ph.
3. SRPC enquired about the reasons for sensing fault in different phases at both ends of line. APTRANSCO stated that they would check and update

in this regard.

4. APTRANSCO further informed that after tripping of 132 kV Tadipathri–Kondapuram feeder, all the loads of 220 kV Tadipathri, 132 kV Komatikuntla, 132 kV RTSS Komali, 132 kV Ankireddypalli Substations and 132 kV Penna Cements were being fed from 220 kV Gooty RS through the path comprising 132 kV Gooty RS–Gudipadu–Ankireddypalli–Komali–Tadipathri feeders.
5. Under this condition, at 14:56 hrs, 132 kV Ankireddypalli–Gudipadu feeder tripped at Ankireddypalli end due to operation of non-directional overcurrent protection enabled in ABB make REX521 type relay.
6. Consequently, complete outage of 220 kV Tadipathri Substation, 132 kV Ankireddypalli, 132 kV Komatikuntla and 132 kV RTSS Komali Substations occurred due to tripping of the only feeder connected to the sole source feeding the loads at that time.

COMPLETE OUTAGE



7. SRPC highlighted that DR records for 132 kV Ankireddypalli–Gudipadu line had not been furnished. APTRANSCO stated that the relay was old and DR facility was not available in the relay. It was further informed that replacement of the relay was being planned.
8. SRPC highlighted DR time synchronisation issue for 132 kV Tadipathri–Kondapuram line. APTRANSCO stated that the relay was not compatible with time synchronisation function.
9. SRPC enquired regarding the status of Auto Reclosure for 132 kV Kondapuram line. APTRANSCO stated that Auto Reclosure was not being enabled for 132 kV lines in APTRANSCO network.
10. SRPC highlighted that 132 kV Penna Cements had been connected as a tap connection and noted violation of CEA Safety Regulations by APTRANSCO.

Recommendations:

✚ **APTRANSCO to comply with CEA Safety Regulations w.r.t the TAP connection at 132kV connectivity for Penna Cement.**

✚ **APTRANSCO to provide DR time sync for 132kV Tadipatri and Kondapuram 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
13	Complete Outage of 220kV Upper Jurala of TGGENCO	220kV Upper Jurala PH was radially connected through 220kV Upper Jurala-Raichur-1&2. The triggering incident is the BBP maloperation at Upper Jurala leading to the tripping of 220kV Upper Jurala-Raichur-1&2. With the tripping of the only connected lines to the 220kV Upper Jurala led to the complete outage of 220kV Upper Jurala of TGGENCO	14-04-2026 05:32	0	0	GD - 1	27-04-2026	20-04-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

In the antecedent condition, 220kV Upper Jurala- Jurala lines-1 &2 are in idle charged condition and 220kV Upper Jurala PH was radially connected through 220kV Upper Jurala-Raichur-1&2. The triggering incident is the BBP maloperation at Upper Jurala leading to the tripping of 220kV Upper Jurala-Raichur-1&2. With the tripping of the only connected lines to the 220kV Upper Jurala led to the complete outage of 220kV Upper Jurala of TGGENCO

2. Time and Date of the Event (घटना का समय और दिनांक: 14-04-2026 05:32

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Karnataka State Demand (MW)	14204	14203
Karnataka State Generation (MW)	7293	7248
Telangana State Demand (MW)	13491	13419
Telangana State Generation (MW)	5730	5706
Grid Frequency (Hz)	50.08	50.09
SR Demand (MW)	59735	59622
SR Generation (MW)	48389	48174

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

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

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-RAICHUR_KA-UPPER_JURALA-1	1. 220KV-RAICHUR_KA-UPPER_JURALA-2 2. UPPER_JURALA(1) - 220KV		

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, 53 minutes

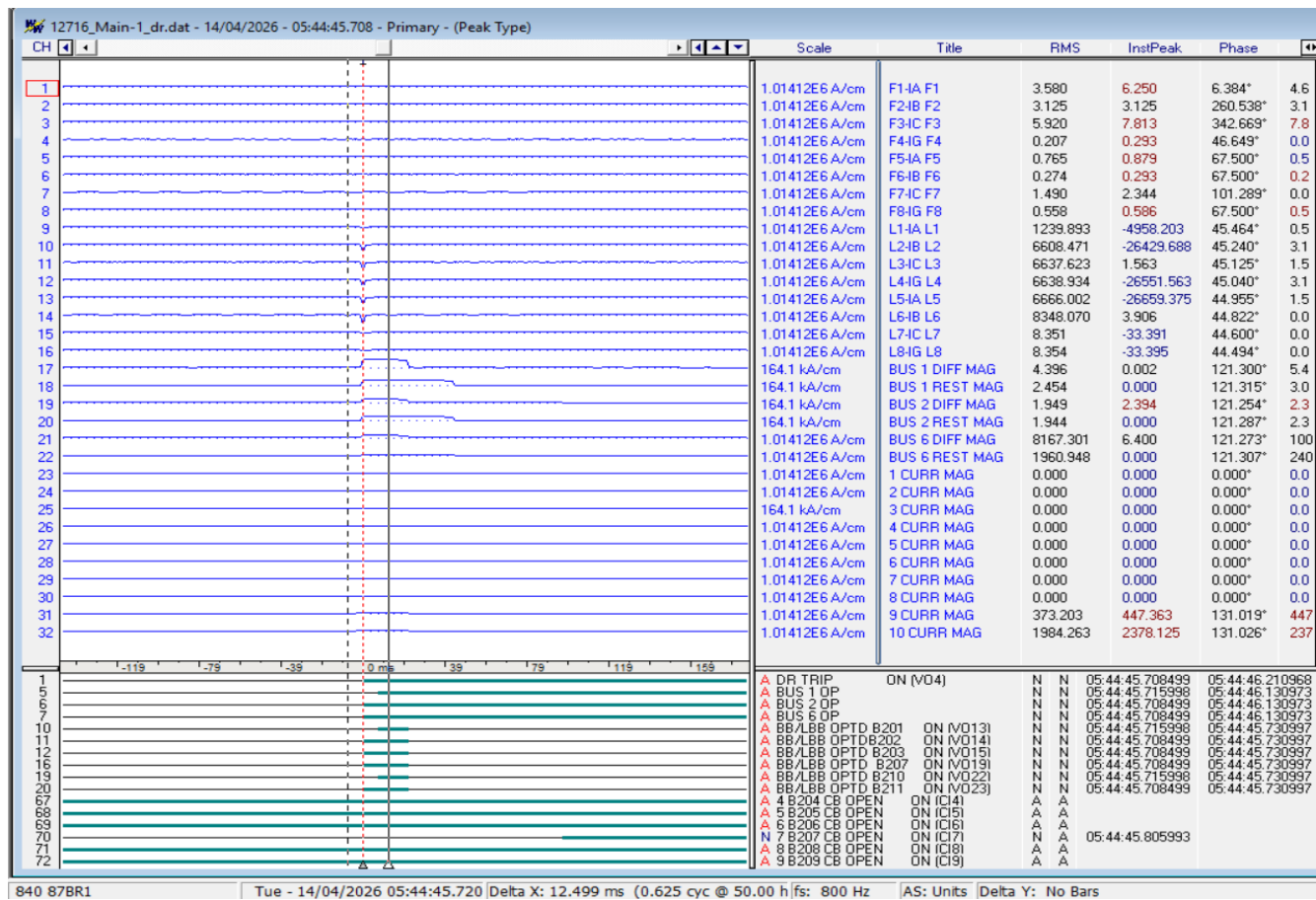
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

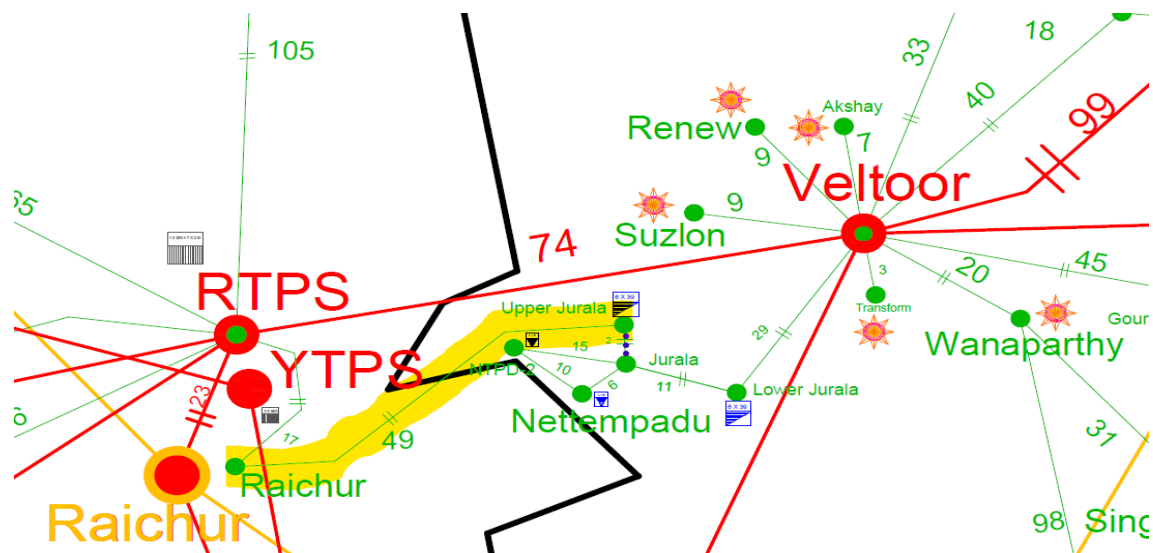
9. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. 220KV-RAICHUR_KA-UPPER_JURALA-2
2. 220KV-RAICHUR_KA-UPPER_JURALA-1

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

In the antecedent condition, 220kV Upper Jurala- Jurala-1 &2 are in idle charged condition and 220kV Upper Jurala PH was radially connected through 220kV Upper Jurala-Raichur-1&2. The triggering incident is the BBP maloperation in only in Main-1 BBP at Upper Jurala and the same can be observed from the DR where in it can be observed a small spike (less than half a cycle) in the current leading to the tripping of all elements connected to Bus-1 and 2 of 220kV Upper Jurala where in no fault is observed in PMU and led to the tripping of 220kV Upper Jurala-Raichur-1&2. With the tripping of the only connected lines to the 220kV Upper Jurala led to the complete outage of 220kV Upper Jurala of TGGENCO.





11. DR Analysis:

220KV-RAICHUR_KA-UPPER_JURALA-1

	RAICHUR_KA - 220KV	UPPER_JURALA - 220KV
Time Sync Issue	No	Yes
DR Analysis	DR not uploaded. Line is holding from this end.	DR Trigger Time:14-04-2026 05:44:45.708 DR TRIP ON (VO4), BUS 2 OP, BUS 6 OP, BB/LBB OPTDB202 ON (VO14), BB/LBB OPTD B203 ON (VO15), BB/LBB OPTD B207 ON (VO19), BB/LBB OPTD B211 ON (VO23) BUS 1 OP, BB/LBB OPTD B201 ON (VO13), BB/LBB OPTD B210 ON (VO22)

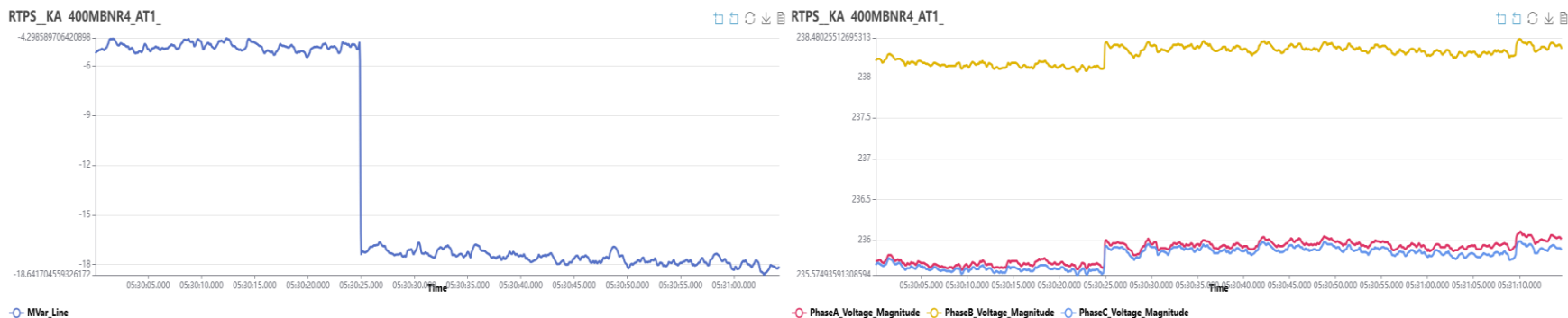
		7 B207 CB OPEN ON (CI7) Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.01 kA
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220KV-RAICHUR_KA-UPPER_JURALA-2

	UPPER_JURALA - 220KV	RAICHUR_KA - 220KV
Time Sync Issue	Yes	No
DR Analysis	<p>DR Trigger Time:14-04-2026 05:44:45.708 DR TRIP ON (VO4), BUS 2 OP, BUS 6 OP, BB/LBB OPTDB202 ON (VO14), BB/LBB OPTD B203 ON (VO15), BB/LBB OPTD B207 ON (VO19), BB/LBB OPTD B211 ON (VO23) BUS 1 OP, BB/LBB OPTD B201 ON (VO13), BB/LBB OPTD B210 ON (VO22) 7 B207 CB OPEN ON (CI7) Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.01 kA DR Trigger Time:14-04-2026 05:44:45.708 DR TRIP ON (VO4), BUS 2 OP, BUS 6 OP, BB/LBB OPTDB202 ON (VO14), BB/LBB OPTD B203 ON (VO15), BB/LBB OPTD B207 ON (VO19), BB/LBB OPTD B211 ON (VO23) BUS 1 OP, BB/LBB OPTD B201 ON (VO13), BB/LBB OPTD B210 ON (VO22)</p>	DR not uploaded. Line is holding from this end.

	7 B207 CB OPEN ON (CI7) Ir (max): 0.00 kA Iy (max): 0.00 kA Ib (max): 0.01 kA	
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12. A) PMU Analysis:



As per the PMU data, fault was not observed.

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

Constituent	Points for review
TGGENCO	1. BBP operation in only one Main needs review during no fault condition 2. Non availability of SCADA SOE at UPPER_JURALA end needs review

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

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

16. Restoration Details:

S.No	Voltage Level (kV)	Name of the Faulty Element/Feeder	Date of Restoration (DD-MM-YYYY)	Time of Restoration (Hrs)
1	220KV	Jurala – Raichur Feeder #1	14.04.2026	06:22 Hrs
2	220KV	Bus coupler	14.04.2026	08:14 Hrs
3	220KV	Jurala – Raichur feeder # 2	14.04.2026	08:44 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)	TGGENCO
2	DR/EL not provided within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TGGENCO, KPTCL
3	Detailed Report not received within 7 days	IEGC section 37.2 (e)	
4	Any other non-compliance	IEGC section 17.3	TGGENCO

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

Annexure 1

Sequence of Events as per SCADA

Nil

Detailed Draft Report of grid event submitted by UPPER JURALA SS:

Detailed Report

Date of Submission : 20-04-2026 11:37

UPPER_JURALA - 220KV tripped at 14-04-2026 05:32 and restored at 20-04-2026 11:19

Summary of Event (घटना का सारांश) : PJHES is Operating with 220KV Double bus with Bus Coupler. During Antecedent conditions, Elements connected to Bus-I are Raichur Feeder-I and Elements Connected to Bus-II are Raichur Feeder-II& Unit#4 MTR back charging.

220KV Jurala – Raichur# 1& 2 feeders, Unit#4 and Bus Coupler was tripped on 14.04.2026 @05:31 HRS ON R-Phase BUS BAR DIFFERENTIAL Protection Main-1.

Inspected the switchyard visually found Normal. The same was informed to LDC and as per the instructions of LDC the Raichur#2 feeder was charged from our end on 14/04/2026 @ 06:22 Hrs. Bus coupler breaker closed on 14.04.2026 @ 08:14 HRS and Raichur

feeder -1 was charged from our end on 14.04.2026 @ 08:44hrs. Normalcy restored.

Time and Date of the event : 14-04-2026 05:32
(घटना का समय और दिनांक)

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : UPPER_JURALA - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-RAICHUR_KA-UPPER_JURALA-1	1. 220KV-RAICHUR_KA-UPPER_JURALA-2 2. UPPER_JURALA\t - 220KV		

Station Connectivity / SLD during antecedent : PJHES is Operating with 220KV Double bus with Bus Coupler.

During Antecedent conditions, Elements connected to Bus-I are Raichur Feeder-I and Elements Connected to Bus-II are Raichur Feeder-II& Unit#4 MTR back charging.

220KV Jurala – Raichur# 1& 2 feeders, Unit#4 and Bus Coupler was tripped on 14.04.2026 @05:31 HRS ON R-Phase BUS BAR DIFFERENTIAL Protection

Main-1. Inspected the switchyard visually found Normal. The same was informed to LDC and as per the instructions of LDC the Raichur#2 feeder was charged from our end on 14/04/2026 @ 06:22 Hrs. Bus coupler breaker closed on 14.04.2026 @ 08:14 Hrs and Raichur feeder -1 was charged from our end on 14.04.2026 @ 08:44hrs

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

PJHES is Operating with 220KV Double Bus with Bus Coupler. During Antecedent conditions, Elements connected to Bus-I are Raichur Feeder-I and Elements Connected to Bus-II are Raichur Feeder-II& Unit#4 MTR back charging.

220KV Jurala – Raichur# 1& 2 feeders,Unit#4 and Bus Coupler was tripped on 14.04.2026 @05:31 HRS ON BUS BAR DIFFERENTIAL Protection. The same was informed to LDC and as per the instructions of LDC the Raichur#2 feeder was charged from our end on 14/04/2026 @ 06:22 Hrs. Bus coupler Breaker is closed on 14.04.2026 @ 08:14 HRs and Raichur feeder -1 was charged from our end on 14.04.2026 @ 08:44hrs

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Others

Other Reason : MAIN-1 BUSBAR DIFFERENTIAL PROTECTION OPERATED

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment :
Failure (if any during the event):

Equipment Type	Equipment Make
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List of elements tripped during the event :
1. 220KV-RAICHUR_KA-UPPER_JURALA-2
2. 220KV-RAICHUR_KA-UPPER_JURALA-1
3. UPPER_JURALA\t - 220KV

Station Connectivity/SLD during the event :
PJHES is Operating with 220KV Double bus with Bus Coupler. During Antecedent conditions, Elements connected to Bus-I are Raichur Feeder-I and Elements Connected to Bus-II are Raichur Feeder-II& Unit#4 MTR back charging.

Analysis of the event :
PJHES is Operating with 220KV Double bus with Bus Coupler. During Antecedent conditions, Elements connected to Bus-I are Raichur Feeder-I and Elements Connected to Bus-II are Raichur Feeder-II& Unit#4 MTR back charging.

220KV Jurala -
Raichur# 1& 2

feeders,Unit#4 and Bus Coupler got tripped on 14.04.2026 @05:31 HRS ON R-Phase BUS BAR DIFFERENTIAL Protection. The same was informed to LDC and as per the instructions of LDC the Raichur#2 feeder was charged from our end on 14/04/2026 @ 06:22 Hrs. Bus coupler Breaker on 14.04.2026 @ 08:14 HRS and Raichur feeder -1 was charged from our end on 14.04.2026 @ 08:44hrs

Protection / Operational Issues observed :

Restoration Details :

Raichur#2 feeder was charged from our end on 14/04/2026 @ 06:22 Hrs.

Bus coupler breaker closed on 14.04.2026 @ 08:14 HRS .

Raichur feeder -1 was charged from our end on 14.04.2026 @ 08:44hrs.

Normalcy restored.

DR Time synchronization issues observed (सुरक्षा/संयोजन) : True

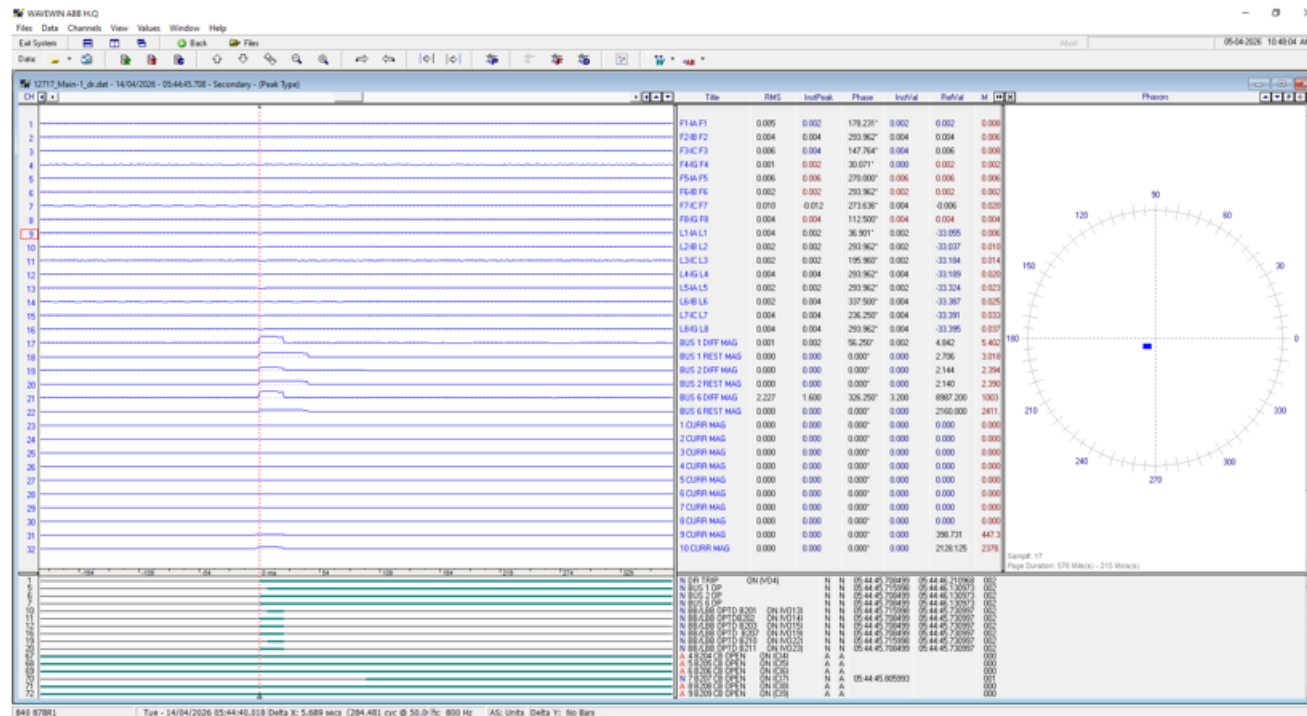
प्रचालन समस्या)

Remedial Measures Taken (सुधारात्मक सुझाव)	:	Inspected switchyard visually found normal.
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	MAIN -1 R-phase BUSBAR DIFFERENTIAL OPERATED
Main I Relay Indications	:	MAIN -1 R-phase BUSBAR DIFFERENTIAL OPERATED
Main II Relay Indications	:	NA
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	4.266
LA Counter	:	
Remarks	:	MAIN -1 R-phase BUSBAR DIFFERENTIAL Protection OPERATED
Attachments	:	1. Others

Deliberations:

1. TGGENCO stated that on 14.04.2026 at 05:32 hrs, 220 kV Jurala–Raichur Line-1 & 2 feeders, Unit-4 and Bus Coupler circuit breakers tripped due to operation of Main-1 Busbar Differential Protection on R-phase. The event resulted in tripping of multiple 220 kV circuit breakers leading to complete outage of Upper Jurala generating station of TGGENCO.

Disturbance Record (DR)



2. TGGENCO informed that post-event inspection of the entire switchyard had been carried out and no abnormalities were observed. It was further stated that no operation was detected in Main-2 relay. TGGENCO informed that line clearance on the busbar had been sought from 02.05.2026 to 05.05.2026 for detailed relay testing and verification of relay healthiness.

3. TANTRANSCO suggested TGGENCO to verify the CT secondary circuits, carry out IR testing of CTs and also check whether any double earthing existed in the CT secondary circuits. SRLDC further suggested TGGENCO to examine the relay cards in detail.
4. SRLDC highlighted that fault current had been observed for nearly half a cycle and opined that the issue might be related to the secondary circuit. Accordingly, TGGENCO was requested to thoroughly review the CT secondary circuits and associated wiring.

Recommendations:

+ TGGENCO to review the CT secondary circuit.

+ Non availability of SCADA SOE at UPPER_JURALA end needs review

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 220kV Pallom SS and 220kV New Pallom SS of KSEB	As per the reports submitted, the triggering incident was B-G bus fault on 220kV Bus-2 of 220kV New Pallom station within the bus protection zone of 220kV Pallom - New Pallom line. However, 220kV Bus-2 BBP did not operate at 220kV New Pallom SS and the fault was continuously being fed through 220kV lines connected to 220kV Pallom SS and 220kV New Pallom SS. Eventually these 220kV lines tripped on zone-2 protection at the remote ends and this led to complete outage of 220kV Pallom SS and 220kV New Pallom SS	14-04-2026 16:40	0	275	GD - 1	25-04-2026	18-04-2026	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 B-G bus fault on 220kV Bus-2 of 220kV New Pallom station within the bus protection zone of

220kV Pallom New Pallom line. However, 220kV Bus-2 BBP did not operate at 220kV New Pallom SS and the fault was continuously being fed through 220kV lines connected to 220kV Pallom SS and 220kV New Pallom SS. Eventually these 220kV lines tripped on zone-2 protection at the remote ends except 220kV Pallom New Pallom line which tripped on over current protection and subsequently after which due to the tripping of grid connected 110kV lines and this led to complete outage of 220kV Pallom SS and 220kV New Pallom SS

2. Time and Date of the Event (घटना का समय और दिनांक: 14-04-2026 16:40

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)	4780	4610
Kerala State Generation (MW)	871	901
Grid Frequency (Hz)	50.06	50.09
SR Demand (MW)	67854	67682
SR Generation (MW)	50564	50288

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At 220kV Pallom SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-SABARIGIRI-PALLOM-1 2. 220KV-PALLOM-NEW PALLOM-1	1. 220KV-KOTTAYAM-PALLOM-1

At 220kV New Pallom SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 220KV-PUNNAPRA-NEW PALLOM-1 2. 220KV-KAYAMKULAM-NEW PALLOM-1	1. 220KV-IDDUKI-NEW PALLOM-1 2. 220KV-PALLOM-NEW PALLOM-1

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

Generation Loss (MW)	Load Loss (MW)
0.0 MW	275.0 MW

7. Duration of interruption (रुकावट की अवधि): 0 hours, 36 minutes

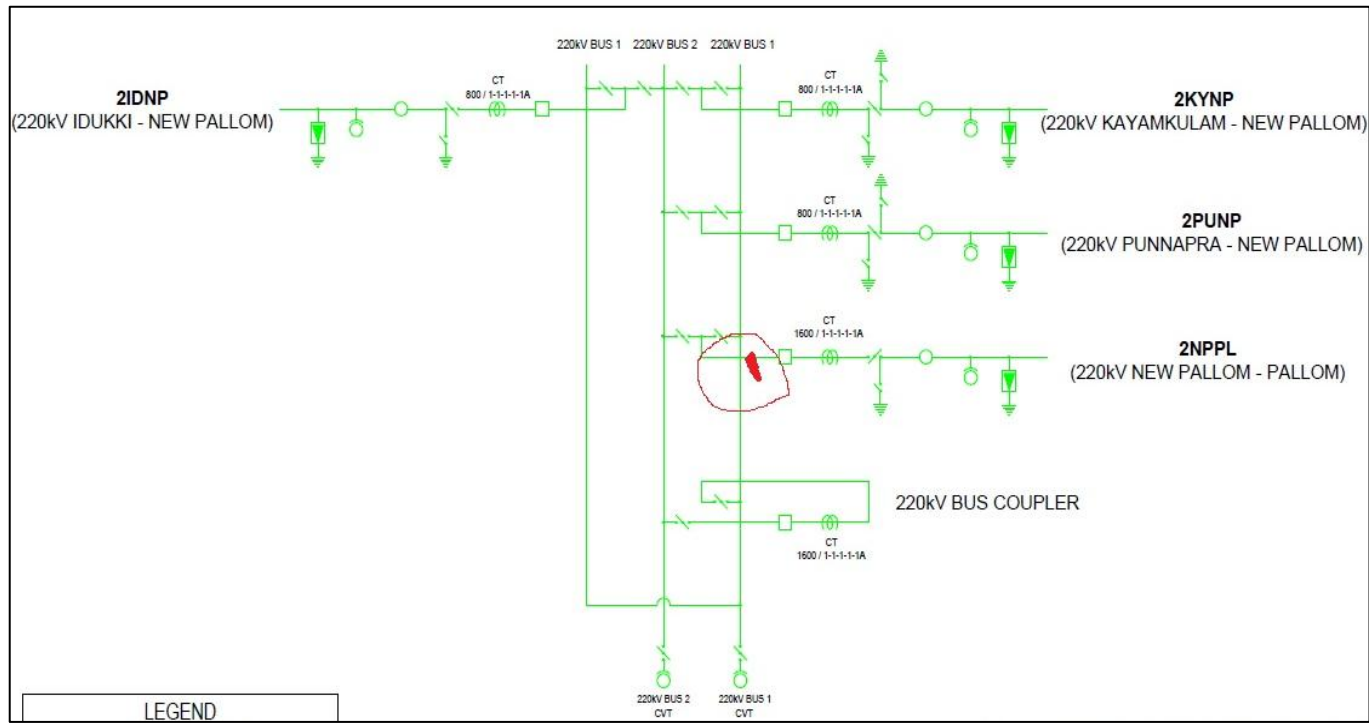
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

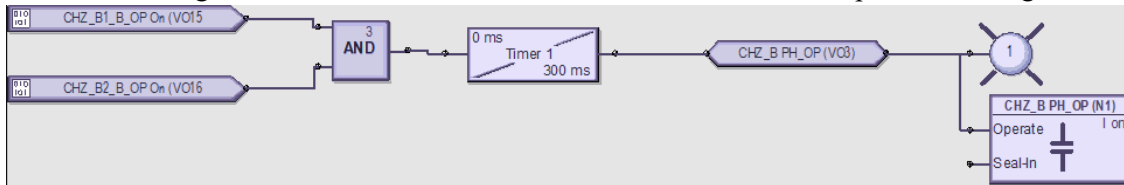
1. 220KV-SABARIGIRI-PALLOM-1
2. 220KV-KOTTAYAM-PALLOM-1
3. 220KV-IDDUKI-NEW PALLOM-1
4. 220KV-KAYAMKULAM-NEW PALLOM-1
5. 220KV-PUNNAPRA-NEW PALLOM-1
6. 220KV-KAYAMKULAM-NEW PALLOM-1

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

As per the reports submitted, the triggering incident was B-G bus fault on 220kV Bus-2 of 220kV New Pallom station within the bus protection zone of 220kV Pallom - New Pallom line due to flashover in the suspension insulator as shown in the SLD below:



During this instance, the main zone busbar protection for both Bus 1 and Bus 2 was sensed at the New Pallom end due to the isolator high status of the 220 kV Pallom–New Pallom line in Bus-1 as well, whereas the isolator status is supposed to be set high only for Bus-2. However, as busbar checkzone protection was not sensed due to logic issue which was as follows and hence BBP did not operate isolating the fault.

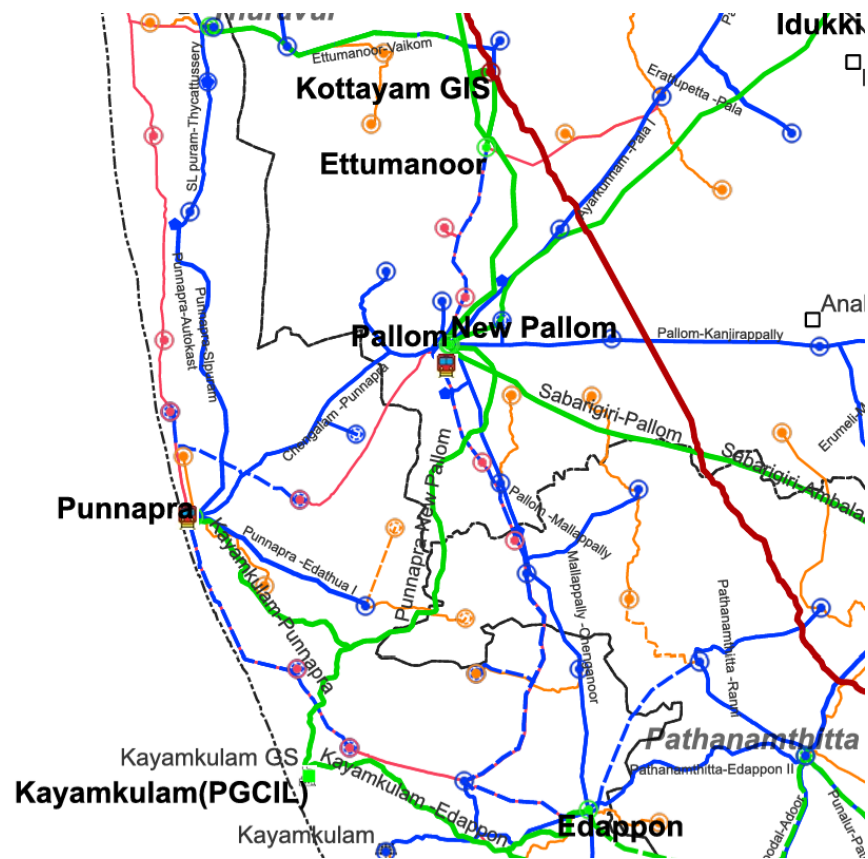


And hence the fault was being fed through 220kV lines connected to 220kV New Pallom SS, where in all lines tripped on remote end on zone-2 protection except 220kV Pallom New Pallom line as the line has pilot wire differential protection with no distance protection in Main-1 and only backup over current protection in Main-2. However, the Backup over current protection of Main-2 has picked up and tripped the line after around 720ms, but before the over current operation, multiple lines tripped at remote ends, and the sequence of tripping of 220kV lines connected to Pallom and New Pallom stations is as shown in the sequence below.

Line Name	Trip Time	Tripped at	Indication
1. 220 kV	14/04/2026	Sabarigiri	Z2

Sabarigiri-Pallom-1	16:40:41:302		
2. 220 kV Idduki-New Pallom-1	14/04/2026 16:40:41:311	Idduki	Z2
3. 220 kV Kottayam-Pallom-1	14/04/2026 16:40:41:344	Kottayam	Z2
4. 220 kV Kayamkulam-New Pallom-1	14/04/2026 16:40:41:345	Kayamkulam	Z2
5. 220 kV Punnapra-New Pallom-1	14/04/2026 16:40:41:433	Punnapra	Z2
6. 220kV Pallom-New Pallom	14/04/2026 16:40:41:631	New Pallom	Over Current

With the tripping of 220kV Pallom-New Pallom led to the complete outage of 220kV New Pallom SS station and clearing of the fault. 220kV Pallom was in service through 110kV connectivity. 220/110kV Pallom ICT-1 tripped during the event (as per SCADA SOE) and further 110kV grid connected lines tripped leading to the Complete outage of 220kV Pallom station.



And hence led to the Complete Outage of 220kV Pallom SS and 220kV New Pallom SS of KSEB

11. DR Analysis:

PALLOM - 220KV

	PALLOM - 220KV
Time Sync Issue	No
DR Analysis	DR not available at this end.

NEW PALLOM - 220KV

	NEW PALLOM - 220KV
Time Sync Issue	Yes
DR Analysis	

220KV-PALLOM-NEW PALLOM-1

	PALLOM - 220KV	NEW PALLOM - 220KV
Time Sync Issue	No	Yes
DR Analysis	DR not available at this end.	DR Trigger Time:14-04-0026 16:40:40.946 50GF, 50GR, 51G2, DD, * 51G, 50QF, 50QR 51P, FSC 51C, 27B81 27C1 DD, * * 51PR 51CR, ICMET * 27A1, 27B1, 3P27, OUT103 3PO, * 51G2R 51GR Ir (max): 0.32 kA Iy (max): 0.73 kA Ib (max): 6.66 kA

220KV-KOTTAYAM-PALLOM-1

	KOTTAYAM - 220KV	PALLOM - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:14-04-2026 16:40:41.305 GEN.TRIP, GEN.TRIP-C, Z2G- OPT, 86A opertaed, 86B operated, M1B Opertaed ARC1_FT, M1R Operated, M1Y Operated Z3S-ORX Ir (max): 0.68 kA Iy (max): 1.24 kA Ib (max): 4.82 kA Vr (max): 121.95 kV Vy (max): 120.58 kV Vb (max): 90.89 kV DR Trigger Time:14-04-2026 16:40:41.295 Zone 2 Trip, 86A TRIP RLY, 86B TRIP RLY, TRIP TO Yph, TRIP TO Bph, TRIP TO Rph A/R Lockout 86B OPTD GCB Q0 B OPEN GCB Q0 R OPEN, GCB Q0 Y OPEN Ir (max): 0.68 kA Iy (max): 1.24 kA Ib (max): 4.97 kA Vr (max): 128.03 kV Vy (max): 127.85 kV Vb (max): 126.91 kV	Line was holding

220KV-SABARIGIRI-PALLOM-1

	SABARIGIRI - 220KV	PALLOM - 220KV
Time Sync Issue	Yes	No
DR Analysis	<p>DR Trigger Time:14-04-2026 16:40:40.913 Dis.Pickup L3, Dis.Pickup E, Dis. forward, Relay PICKUP, Relay PICKUP L3, Relay PICKUP E Dis. Pickup Z2, Dis. Pickup Z3 Dis.TripZ2/3p, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3, Relay TRIP 1pole open L3 Ir (max): 0.32 kA Iy (max): 0.88 kA Ib (max): 2.32 kA Vr (max): 129.13 kV Vy (max): 128.32 kV Vb (max): 127.12 kV DR Trigger Time:14-04-2026 16:40:18.114 21 Pickup ØC, 21 Pickup G, Relay PICKUP, Relay PICKUP ØC, Relay PICKUP G 21 PU forward, 21 PU Z3 21 PU Z2 21 TRIP 3p. Z2, Relay TRIP ØA, Relay TRIP ØB, Relay TRIP ØC, Relay TRIP >52b 3p Open, >52b Bkr1 3p Op 1pole open ØC Ir (max): 0.32 kA Iy (max): 0.88 kA Ib (max): 2.32 kA Vr (max): 128.80 kV Vy (max): 128.33 kV Vb (max): 127.15 kV</p>	Line was holding

220KV-IDDUKI-NEW PALLOM-1

	IDDUKI - 220KV	NEW PALLOM - 220KV
Time Sync Issue	Yes	No
DR Analysis	DR Trigger Time:14-04-2026 16:40:11.311 PHASE SELECT CG OSC TRIGGER ON (VO64) OSC TRIGGER ON (VO64), GND DIST Z2 OP L3 M CB B OPN ON (CI3) L1 M CB R OPN ON (CI1) L2 M CB Y OPN ON (CI2) PHASE SELECT BC PHASE SELECT BC Ir (max): 0.40 kA Iy (max): 0.63 kA Ib (max): 3.31 kA Vr (max): 128.27 kV Vy (max): 127.22 kV Vb (max): 126.81 kV DR Trigger Time:14-04-2026 16:40:40.937 Any Start DIST Start C DIST Fwd, Z2, Z3 Any Trip, DIST Trip C L4-86B OPTD L6-86A OPTD Ir (max): 0.41 kA Iy (max): 0.63 kA Ib (max): 3.34 kA Vr (max): 128.26 kV Vy (max): 127.71 kV Vb (max): 126.19 kV	Line was holding

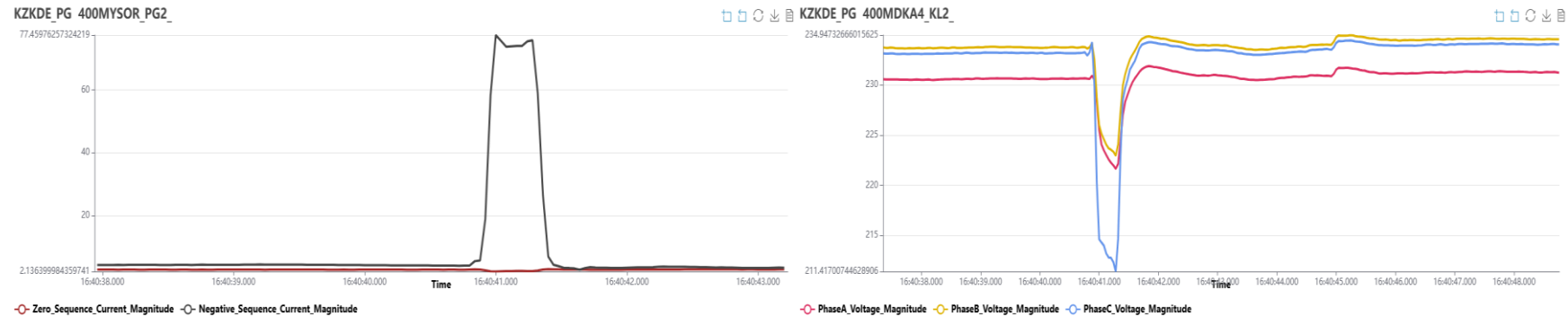
220KV-KAYAMKULAM-NEW PALLOM-1

	KAYAMKULAM - 220KV	NEW PALLOM - 220KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:14-04-2026 16:40:40.940 T1 Any Start DIST Fwd Z3 T2 10_CB HEALTHY Ir (max): 0.09 kA Iy (max): 0.36 kA Ib (max): 2.14 kA Vr (max): 127.45 kV Vy (max): 127.87 kV Vb (max): 126.68 kV DR Trigger Time:14-04-2026 16:40:40.949 PHS-STFWL3, PHS-STFWPE ZM03-START ZM02-START TRIP_TRIP, TRIP L1, TRIP L2, TRIP L3, ZM02-TRIP CB OPEN R CB OPEN Y, CB OPEN B Ir (max): 0.09 kA Iy (max): 0.36 kA Ib (max): 2.13 kA Vr (max): 127.30 kV Vy (max): 127.79 kV Vb (max): 126.73 kV	Line was holding

220KV-PUNNAPRA-NEW PALLOM-1

	PUNNAPRA - 220KV	NEW PALLOM - 220KV
Time Sync Issue	Yes	No
DR Analysis	<p>DR Trigger Time:14-04-2026 16:40:40.959 EF Pickup, Relay PICKUP, Relay PICKUP L3, Relay PICKUP E Dis.Pickup L3, Dis.Pickup E, Dis. forward, Dis. Pickup Z3 Dis. Pickup Z2, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3, Relay TRIP 1pole open L3 Ir (max): 0.37 kA Iy (max): 1.01 kA Ib (max): 2.30 kA Vr (max): 126.08 kV Vy (max): 125.61 kV Vb (max): 125.05 kV DR Trigger Time:13-04-1996 16:40:40.959 EF Pickup, Relay PICKUP, Relay PICKUP L3, Relay PICKUP E Dis. forward, Dis. Pickup Z3 Dis. Pickup Z2, Dis.Gen. Trip, Dis.TripZ2/3p, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3, Relay TRIP 1pole open L3 Ir (max): 0.37 kA Iy (max): 1.01 kA Ib (max): 2.30 kA Vr (max): 125.96 kV Vy (max): 125.70 kV Vb (max): 125.04 kV</p>	Line was holding

12. A) PMU Analysis:



From the PMU plot , B-G fault can be observed in the Pallom-New Pallom line with delayed clearance of around 400ms.

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

Constituent	Points for review
KSEB	<ol style="list-style-type: none"> 1. The non-operation of checkzone busbar protection at 220kV New Pallom SS needs review 2. The high status of Bus-1 isolator of 220kV Pallom New Pallom line at New Pallom SS needs review. 3. The non availabilty of distance protection in Pallom-New Pallom line needs review. 4. Protection settings co-ordination of Backup over current protection of 220kV Pallom New Pallom and Zone-2 of 220kV lines connected to 220kV Pallom SS Needs review.

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

Constituent	Remedial Actions
KSEB	<ol style="list-style-type: none"> 1. Logic has been corrected at New Pallom end for the checkzone busbar protection.

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

16. Restoration Details:

14/04/2026 17:16

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

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
14-04-2026 16:40:52	NEW PALLOM CB COUPLER CB 20452 OPEN	NPLM2_KL
14-04-2026 17:04:07	PALLOM CB CAPACITOR CB 10152 OPEN	PLLM2_KL
14-04-2026 17:04:37	PALLOM CB 10952 (T2_P) OPEN	PLLM2_KL
14-04-2026 17:05:26	PALLOM CB 60952 (T1_P) OPEN	PLLM2_KL
14-04-2026 17:05:37	PALLOM CB 60552 (LOAD KTND6) OPEN	PLLM2_KL
14-04-2026 17:05:47	PALLOM CB 60852 (LOAD ETMR6) OPEN	PLLM2_KL
14-04-2026 17:05:47	PALLOM CB 60752 (LOAD GNDR6) OPEN	PLLM2_KL
14-04-2026 17:12:09	PALLOM CB 20152 (LINE TO SBGR2) OPEN	PLLM2_KL
14-04-2026 17:12:14	PALLOM CB 20352 (T1_P) OPEN	PLLM2_KL

Detailed Draft Report of grid event submitted by NEW PALLOM SS:

Detailed Report

Date of Submission : 18-04-2026 16:20

NEW PALLOM - 220KV tripped at 14-04-2026 16:40 and restored at 18-04-2026 14:25

Summary of Event (घटना का सारांश) : On 14.04.2026 at 16:40 hrs, a bus fault occurred at the 220 kV Switching Station, New Pallom. The fault was identified at the suspension insulator in the cross bus of 2NPPL, connected to the junction of Bus-1 and Bus-2 isolator.

Time and Date of the event (घटना का समय और दिनांक) : 14-04-2026 16:40

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : NEW PALLOM - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-PUNNAPRA-NEW PALLOM-1 2. 220KV-KAYAMKULAM-NEW PALLOM-1	1. 220KV-IDDUKI-NEW PALLOM-1 2. 220KV-PALLOM-NEW PALLOM-1		

Station Connectivity / SLD during antecedent :

Sl. No	Feeder Name	Load (MW)	Bus
1	220 kV Idukki – New Pallom	41	2
2	220 kV Punnapra – New Pallom	-31	1
3	220 kV Pallom – New Pallom	-46	2
4	220 kV Kayamkulam – New Pallom	36	1
5	220 kV Bus Coupler	—	BC Closed

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) : On 14.04.2026 at 16:40 hrs, a bus fault occurred at the 220 kV Switching Station, New Pallom. The fault was identified at the suspension insulator in the cross bus of 2NPPL, connected to the junction of Bus-1 and Bus-2 isolator.

During the event, the busbar protection did not operate as the check zone was found in a 'non-operate' condition. However, Main Zone-1 and Zone-2 protections operated. Upon analysis of the logic unit, it was observed that both Bus-1 and Bus-2 isolator status were indicated as 'high'. Further investigation revealed that the Bus-1 isolator auxiliary contact was faulty and remained in the 'high' position, which resulted in incorrect zone selection and caused both zones to operate simultaneously.

Due to the non-operation of busbar protection, all feeders of Pallom and New Pallom—except 2NPPL—tripped from the remote end under Zone-2 protection. The affected feeders are listed below:

- 2SBPL
- 2KOPL
- 2PUNP
- 2KYNP
- 2IDNP

The event report of the busbar protection (GE B90) has been downloaded and is attached. Disturbance Recorder (DR) data from the busbar protection is not available due to its non-operation.

Additionally, the following records are enclosed for detailed analysis:

- DR from backup 50/51 relay of 2NPPL at Pallom
- DR from Kottayam GIS
- DR from Sabarigiri Generating Station
- DR from Idukki Generating Station
- DR from Punnapra Substation

It is also noted that all other relays associated with 2NPPL, including the pilot wire differential protection, are electro-mechanical in nature.

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None, None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : 400.0

Load and Generation Loss :
(लॉड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	275 MW

Duration of interruption :
(रुकावट की अवधि)

Details of Equipment Failure :
(if any during the event):

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event :
1. 220KV-IDDUKI-NEW PALLOM-1
2. 220KV-KAYAMKULAM-NEW PALLOM-1
3. 220KV-PUNNAPRA-NEW PALLOM-1
4. 220KV-PALLOM-NEW PALLOM-1

Station Connectivity/SLD during the event :

Analysis of the event :

Delayed tripping of 220kV Pallom - N Pallom being reviewed.

Protection / Operational Issues observed :

During the event, the busbar protection did not operate as the check zone was found in a 'non-operate' condition. However, Main Zone-1 and Zone-2 protections operated. Upon analysis of the logic unit, it was observed that both Bus-1 and Bus-2 isolator status were indicated as 'high'. Further investigation revealed that the Bus-1 isolator auxiliary contact was faulty and remained in the 'high' position, which resulted in incorrect zone selection and caused both zones to operate simultaneously.

Due to the non-operation of busbar protection, all feeders of Pallom and New Pallom except 2NPPL tripped from the remote end under Zone-2 protection. The New Pallom Pallom tripped in backup protection around 505 ms

Restoration Details :

Date	Element	Tripping Time	Charging Time
14.04.2026	220kV Idukki New Pallom	16:40	17:32
14.04.2026	220kV New Pallom Pallom	16:40	13:45 (16.04.2026)
14.04.2026	220kV Punnapra New Pallom	16:40	18:35
14.04.2026	220kV Kayamkulam New Pallom	16:40	18::31
14.04.2026	220kV Kottayam Pallom	16:40	17:16
14.04.2026	220kV Sabarigiri Pallom	16:40	17:19
14.04.2026	Pallom 200MVA 220/110kV Trasormer No 1	16:40	17:44
14.04.2026	Pallom 200MVA 220/110kV Trasormer No 2	16:40	17:44

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	Relay settings are verified. Corrective action in progress.
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	
Main I Relay Indications	:	
Main II Relay Indications	:	
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	
Attachments	:	

Detailed Draft Report of grid event submitted by PALLOM SS:

Detailed Report

Date of Submission : 18-04-2026 16:26

PALLOM - 220KV tripped at 14-04-2026 16:40 and restored at 18-04-2026 16:21

Summary of Event (घटना का सारांश) : On 14.04.2026 at 16:40 hrs, a bus fault occurred at the 220 kV Switching Station, New Pallom. The fault was identified at the suspension insulator in the cross bus of 2NPPL, connected to the junction of Bus-1 and Bus-2 isolator.

Time and Date of the event (घटना का समय और दिनांक) : 14-04-2026 16:40

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : PALLOM - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GD - 1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-SABARIGIRI-PALLOM-1 2. 220KV-PALLOM-NEW PALLOM-1	1. 220KV-KOTTAYAM-PALLOM-1		

Station Connectivity / SLD during antecedent :

Sl. No	Feeder Name	Load (MW)	Bus
1	220 kV Sabarigiri – Pallom	117	1
2	220 kV Kottayam – Pallom	104	2
3	220 kV Pallom – New Pallom	46	1
4	220/110 kV 200 MVA ICT-1	137	1
5	220/110 kV 200 MVA ICT-2	138	2
6	220 kV Bus Coupler	—	BC Closed

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) : On 14.04.2026 at 16:40 hrs, a bus fault occurred at the 220 kV Switching Station, New Pallom. The fault was identified at the suspension insulator in the cross bus of 2NPPL, connected to the junction of Bus-1 and Bus-2 isolator.

During the event, the busbar protection did not operate as the check zone was found in a 'non-operate' condition. However, Main Zone-1 and Zone-2 protections operated. Upon analysis of the logic unit, it was observed that both Bus-1 and Bus-2 isolator status were indicated as 'high'. Further investigation revealed that the Bus-1 isolator auxiliary contact was faulty and remained in the 'high' position, which resulted in incorrect zone selection and caused both zones to operate simultaneously.

Due to the non-operation of busbar protection, all feeders of Pallom and New Pallom—except 2NPPL—tripped from the remote end under Zone-2 protection. The affected feeders are listed below:

- 2SBPL
- 2KOPL
- 2PUNP
- 2KYNP
- 2IDNP

The event report of the busbar protection (GE B90) has been downloaded and is attached. Disturbance

Recorder (DR) data from the busbar protection is not available due to its non-operation.

Additionally, the following records are enclosed for detailed analysis:

- DR from backup 50/51 relay of 2NPPL at Pallom
- DR from Kottayam GIS
- DR from Sabarigiri Generating Station
- DR from Idukki Generating Station
- DR from Punnapra Substation

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Others

Other Reason : Pallom - N Pallom 220kV feeder tripped on fault. But due to delayed clearing of the fault, all incoming 220kV feeders to Pallom 220kV S/s tripped at remote end on Zone 2 DP.

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	270 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment Failure :
(if any during the event):

Equipment Type	Equipment Make
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List of elements tripped during the event : 1. 220KV-SABARIGIRI-PALLOM-1
2. 220KV-KOTTAYAM-PALLOM-1

Station Connectivity/SLD during the event :

Analysis of the event : Delayed tripping of 220kV Pallom - N Pallom being reviewed.

Protection / Operational Issues observed :

During the event, the busbar protection did not operate as the check zone was found in a 'non-operate' condition. However, Main Zone-1 and Zone-2 protections operated. Upon analysis of the logic unit, it was observed that both Bus-1 and Bus-2 isolator status were indicated as 'high'. Further investigation revealed that the Bus-1 isolator auxiliary contact was faulty and remained in the 'high' position, which resulted in incorrect zone selection and caused both zones to operate simultaneously.

Due to the non-operation of busbar protection, all feeders of Pallom and New Pallom except 2NPPL tripped from the remote end under Zone-2 protection. The New Pallom Pallom tripped in backup protection around 505 ms

Restoration Details :

Date	Element	Tripping Time	Charging Time
14.04.2026	220kV Idukki New Pallom	16:40	17:32
14.04.2026	220kV New Pallom Pallom	16:40	13:45 (16.04.2026)
14.04.2026	220kV Punnapra New Pallom	16:40	18:35
14.04.2026	220kV Kayamkulam New Pallom	16:40	18::31
14.04.2026	220kV Kottayam Pallom	16:40	17:16
14.04.2026	220kV Sabarigiri Pallom	16:40	17:19
14.04.2026	Pallom 200MVA 220/110kV Transormer No 1	16:40	17:44
14.04.2026	Pallom 200MVA 220/110kV Transormer No 2	16:40	17:44

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) :

Relay/PLCC Operation Details :

Control Panel Anunciation :

Main I Relay Indications	:	
Main II Relay Indications	:	
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	
Attachments	:	

Deliberations:

1. KSEBL stated that, under antecedent conditions, at New Pallom Substation, 220 kV Bus-1 comprised 2PUNP and 2KYNP feeders, while 220 kV Bus-2 comprised 2IDNP and 2NPPL feeders. The 220 kV Bus Coupler was kept closed. Further, at Pallom Substation, the station was operating with single bus arrangement along with Bus Section, with 2KOPL, 2SBPL, 2NPPL feeders and 220/110 kV Transformer-1 and Transformer-2 in service.
2. KSEBL informed that the triggering incident was a bus fault that occurred at 16:40 hrs at 220 kV New Pallom Switching Station. The fault was identified at the suspension insulator in the cross bus of 2NPPL feeder connected to the junction of Bus-1 and Bus-2 isolators. It was stated that the fault was within the Busbar Protection Zone of Bus-2; however, the busbar protection did not operate.
3. KSEBL stated that the check zone of GE Multilin B90 relay-based Busbar Protection at New Pallom Substation was found to be in non-operate condition due to logic error. KSEBL informed that Busbar Protection Main Zone-1 and Zone-2 had operated. Upon analysis of the logic unit, it was observed that both Bus-1 and Bus-2 isolator statuses of 2NPPL feeder were indicated as “high”. Due to non-operation of the check zone logic, all 220 kV feeders of Pallom and New Pallom Substations, namely 2SBPL, 2KOPL, 2PUNP, 2KYNP and 2IDNP, except 2NPPL feeder, tripped from remote ends under Zone-2 protection.
4. KSEBL further informed that, upon detailed post-event analysis, the fault was identified at the suspension insulator in the cross bus of 2NPPL feeder connected to the junction of Bus-1 and Bus-2 isolators. Site inspection revealed that the actual initiation of the fault was due to external flashover along the surface of the upper disc insulators of the suspension string caused by aluminium strands from a bird nest located just above the string insulator.
5. It was further informed that although Busbar Protection Main Zone-1 and Zone-2 protections had operated, analysis of the logic unit revealed that both Bus-1 and Bus-2 isolator statuses were indicated as “high”. Further investigation identified that the Bus-1 isolator auxiliary contact was faulty and remained in “high” position, resulting in incorrect zone selection and simultaneous enabling of both zone selections.
6. KSEBL further informed that in the GE Multilin B90 relay-based Busbar Protection at New Pallom Substation, the check zone logic for B-phase had been configured with AND logic instead of the required OR logic.
7. **Remedial Actions Taken:**
 - Corrected the 220 kV busbar check zone logic (logical correction in Check Zone C-phase).
 - Resolved the 220 kV Bus-1 isolator status issue.
 - Replaced the faulty insulator at 220 kV New Pallom substation on 2NPPL and restored the feeder to service.
 - Taken up upgrading the LDP for 2NPPL with numerical relay on OFC. Distance Zone 1 with time delay can be implemented.
 - BBP Setting & Logic verification are made part of Internal Audit, from 2026, for all substations at 220kV & above.
8. SRPC recommended KSEBL to include verification of Busbar Protection logic in the internal audit checklist. KSEBL agreed to the same.

Recommendations:

- ✚ KSEBL to rectify DR Time sync issue at New Pallom, Sabaragiri & Idduki 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
15	Complete outage of 400kV JSW_Rajapura and JSW_Gowripura of JSW	400kV JSW_Rajapura and JSW_Gowripura of JSW is radially connected to Jindal TPS through 400kV Jindal TPS- JSW_Rajapura. The triggering incident is the R-G fault in the multicircuit tower portion in 400kV Jindal-BPS-4 and 400kV Jindal TPS- JSW_Rajapura and the lines tripped. Due to the tripping of the only connected line to 400kV JSW_Rajapura and JSW_Gowripura led to the complete outage of 400kV JSW_Rajapura and JSW_Gowripura. During the same time 400kV Jindal-BPS-3 tripped due to suspected ground potential rise.	16-04-2026 15:18	200	0	GD - 1	05-05-2026	-	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

400kV JSW_Rajapura_Solar and JSW_Gowripura_Wind of JSW is radially connected to Jindal TPS through 400kV Jindal TPS- JSW_Rajapura_Solar. The triggering incident is the R-G fault in the multi-circuit tower portion in 400kV Jindal-BPS-4 and 400kV Jindal TPS- JSW_Rajapura_Solar and the lines tripped. Due to the tripping of the only connected line to 400kV JSW_Rajapura_Solar and JSW_Gowripura_Wind led to the complete outage of 400kV JSW_Rajapura_Solar and JSW_Gowripura_Wind. During the same time 400kV Jindal-BPS-3 tripped due to suspected ground potential rise.

2. Time and Date of the Event (घटना का समय और दिनांक: 16-04-2026 15:18

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)	18520	18520
Karnataka State Generation (MW)	9706	9757
Grid Frequency (Hz)	50.0	50.08
SR Demand (MW)	73846	73846
SR Generation (MW)	57075	57075

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

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

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

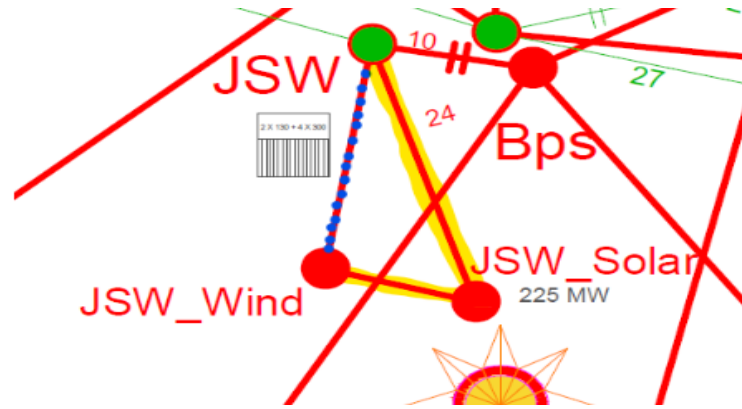
Generation Loss (MW)		Load Loss (MW)
Solar	55.0 MW	0.0 MW
Wind	0.0 MW	
Others	0.0 MW	
Total	55.0 MW	

7. Duration of interruption (रुकावट की अवधि): 5 hours, 10 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-JINDAL-BPS-3
2. 400KV-JINDAL-RAJAPURA_S-1
3. 400KV-JINDAL-BPS-4
4. 400KV-JINDAL-GOWRIPURA_W-1

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

400kV JSW_Rajapura_Solar and JSW_Gowripura_Wind of JSW is radially connected to Jindal TPS through 400kV Jindal TPS- JSW_Rajapura_Solar as shown below.



Event at 15:17 Hrs:

As per the reports submitted, the triggering incident was an R-G fault on the Jindal-BPS-4 during the installation of OPGW between tower no 21& 22 where in the earth wire got damaged and came into vicinity of 400KV-JINDAL-BPS-4 due inclement weather conditions. Further the AR was disabled for OPGW installation. At both ends of the line, the R-G fault was detected in Zone 1, and due to disabling of (A/R), a three-phase tripping occurred. During the same time, 400kV Jindal-BPS-3 line tripped at the Jindal end due to suspected ground potential rise only in Y and B phases, and the R phase was still in service which tripped after around 2.1s on suspected PD operation.

Event at 15:22 Hrs:

Further 400kV Jindal-BPS line earth guard wire came into contact with the Y and B phases of the 400 kV Jindal-Rajapura_Solar-1 line, resulting in a Y-B fault on the line. At the Jindal end, the fault was detected in Zone 1, leading to three-phase tripping.

Since 400kV JSW_Rajapura_Solar and JSW_Gowripura_Wind of JSW is radially connected to Jindal TPS through 400kV Jindal TPS- JSW_Rajapura_Solar, this Y-B fault tripping led to the complete outage of the 400 kV JSW Rajapura_Solar and 400 kV JSW Gowripura_Wind stations.

11. DR Analysis:

400KV-JINDAL-BPS-3

	JINDAL - 400KV	BPS - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:16-04-2026 15:17:44.686 Any Start	DR Trigger Time:16-04-2026 15:17:44.690 Any Start

	DIST Fwd Z3 Ir (max): 3.88 kA Iy (max): 2.43 kA Ib (max): 2.53 kA Vr (max): 231.04 kV Vy (max): 276.77 kV Vb (max): 246.03 kV	T1 Ir (max): 3.87 kA Iy (max): 2.42 kA Ib (max): 2.52 kA Vr (max): 236.04 kV Vy (max): 286.21 kV Vb (max): 245.23 kV DR Trigger Time:16-04-2026 16:33:54.741 STUB_RELEASE Ir (max): 0.01 kA Iy (max): 0.00 kA Ib (max): 0.00 kA Vr (max): 0.29 kV Vy (max): 0.35 kV Vb (max): 0.45 kV
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400KV-JINDAL-BPS-4

	JINDAL - 400KV	BPS - 400KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:16-04-2026 15:17:44.685 Any Start DIST Fwd Any Trip, DIST Trip A, Z1 Ir (max): 17.48 kA Iy (max): 2.25 kA Ib (max): 2.37 kA Vr (max): 231.09 kV Vy (max): 307.06 kV Vb (max): 230.32 kV	DR Trigger Time:16-04-2026 15:17:44.688 Any Start T1 Any Trip, Z1, Z2, Z3, DIST Trip A, DIST Sig. Send, Z1X L4 3-PH GR-A OP L1 M_CB R OPN L2 M_CB Y OPN, L3 M_CB B OPN Ir (max): 17.30 kA Iy (max): 2.26 kA Ib (max): 2.38 kA Vr (max): 231.55 kV Vy (max): 315.59 kV Vb (max): 231.78 kV

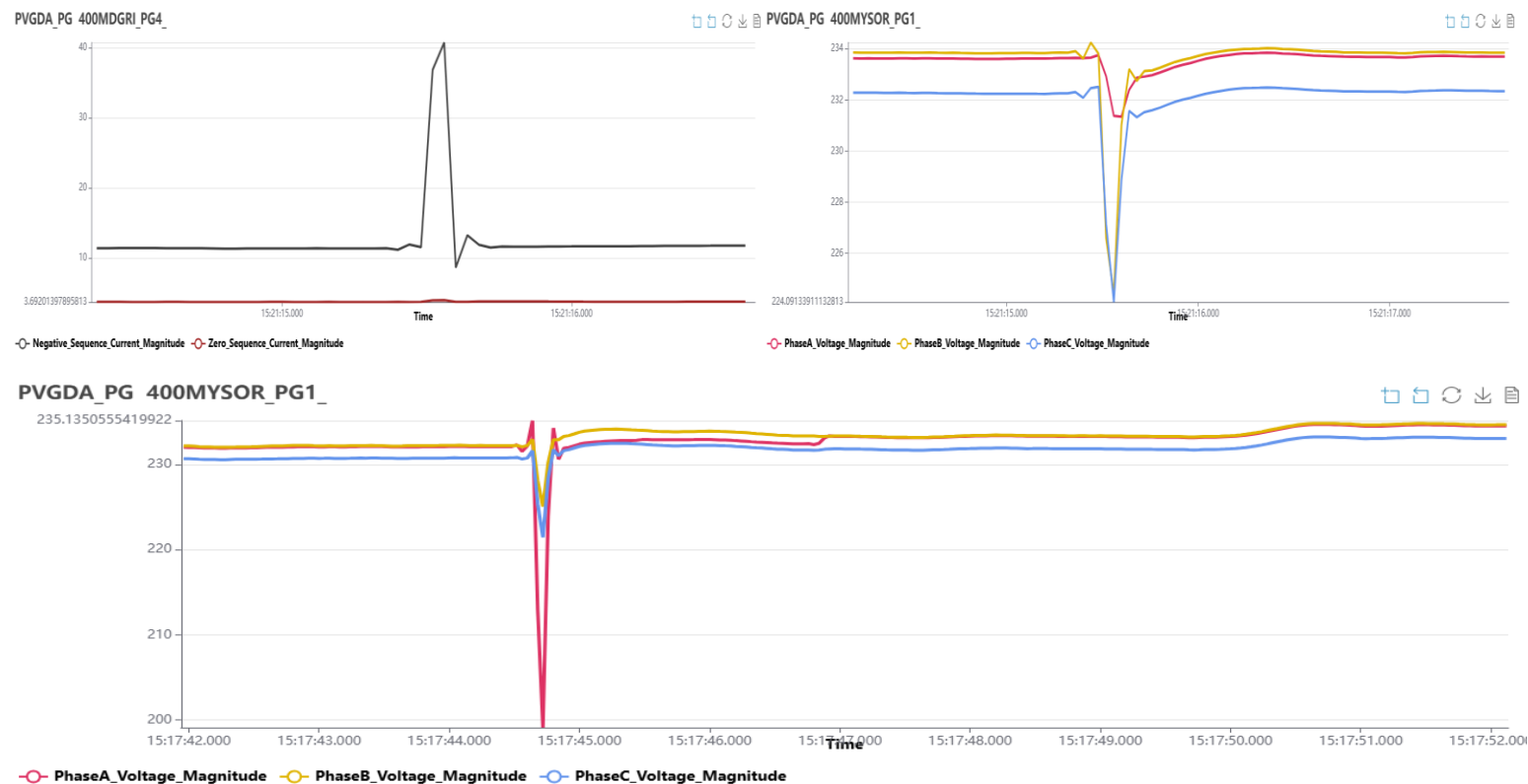
		DR Trigger Time:16-04-2026 15:17:44.699 ZM03-START, M2Z3_ST Z1 TRIP, M2_TRIP, M2Z1_OP, M2Z2_ST, M12CRSD, TRP1-TRIP, TRIP_R TRP1-TR3P, TRIP_Y, TRIP_B GRB_OPD Ir (max): 17.24 kA Iy (max): 2.26 kA Ib (max): 2.38 kA Vr (max): 232.17 kV Vy (max): 315.83 kV Vb (max): 232.10 kV
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400KV-JINDAL-RAJAPURA_S-1

	RAJAPURA_S - 400KV	JINDAL - 400KV
Time Sync Issue	No	No
DR Analysis		DR Trigger Time:16-04-2026 15:22:58.369 TOC1-START PHS-STFWL2, PHS-STFWL3 ZM02-START, ZM03-START ZM01-TRIP, ZM01-START, ZCOM_CS TRIP_TRIP, TRIP L1, TRIP L2, TRIP L3, 3PH-TRIP AR_BLOCK TOV1-START CARR_RECVD Ir (max): 0.20 kA Iy (max): 12.15

		kA Ib (max): 11.97 kA Vr (max): 291.17 kV Vy (max): 232.52 kV Vb (max): 222.89 kV DR Trigger Time:16-04-2026 15:22:58.371 Any Start Any Trip, DIST Trip A, DIST Trip B, DIST Trip C, DIST Fwd, Z1, Z2, Z3, TBC G-B TRIP RPH, TBC G- B TRIP YPH, TBC G-B TRIP BPH, MCB G-B TRIP YPH, MCB G-B TRIP BPH, CARRIER SEND, MCB G-B 3PH TRIP, TBC G-B 3PH TRIP, BLCOK AR MAIN CB, 3PH TRIP MAIN CB, BLOCK AR TBC CB DIST. Chan Recv, CARRIER RECEIVED Any Pole Dead Any Pole Dead Ir (max): 0.21 kA Iy (max): 12.23 kA Ib (max): 12.04 kA Vr (max): 293.16 kV Vy (max): 238.80 kV Vb (max): 223.46 kV
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12. A) PMU Analysis:



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

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

Constituent	Points for review
JSW_THERMAL	1. Tripping of 400KV-JINDAL-BPS-3 at JINDAL end on GPR needs review.
JSW_RE	Non furnishing of information at JSW_RE end needs review

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

Constituent	Remedial Actions
JSW_THERMAL	After OPGW setup removal in BPS line 4, line 3 charged on 16.04.2026 @20.31hrs.

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

16. Restoration Details:

16/04/2026 20:28

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

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

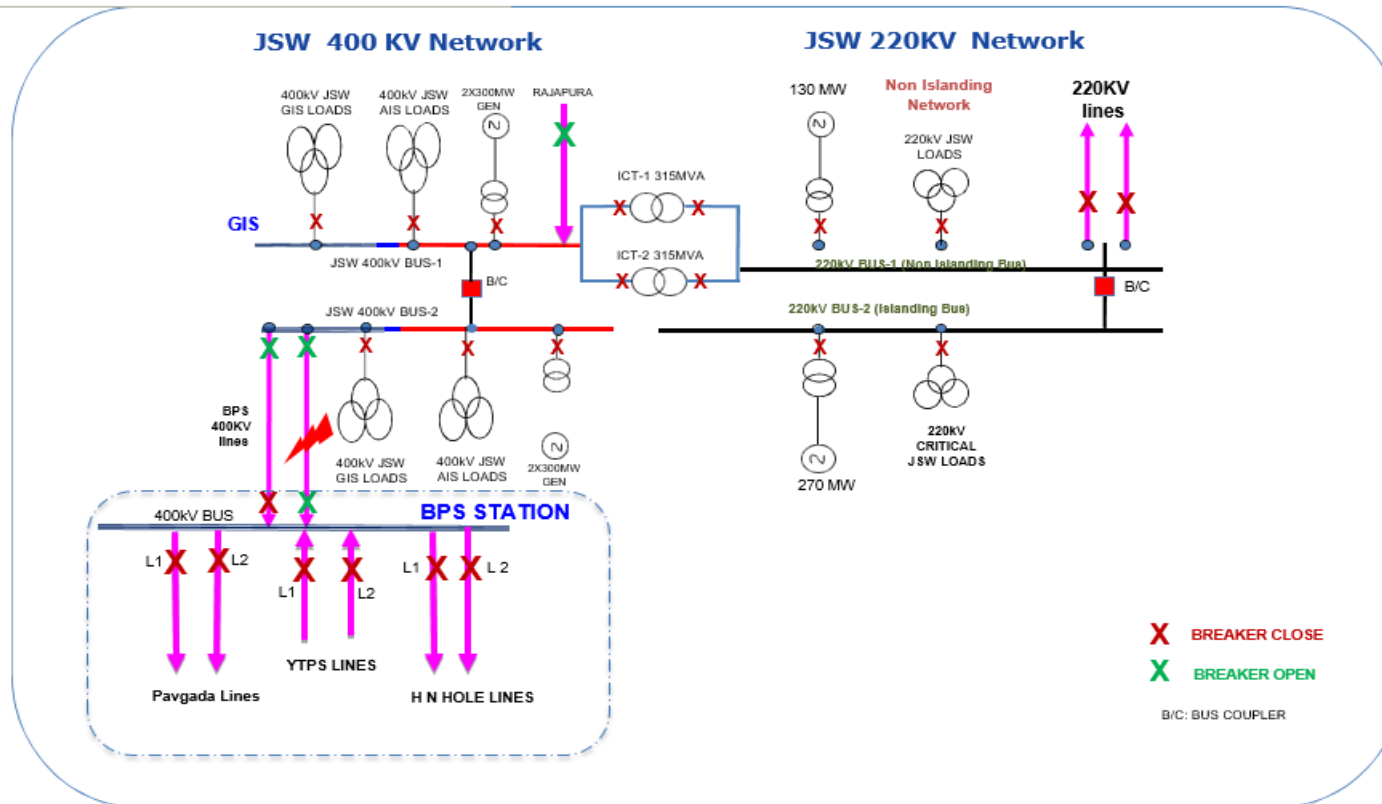
Annexure 1

Sequence of Events as per SCADA

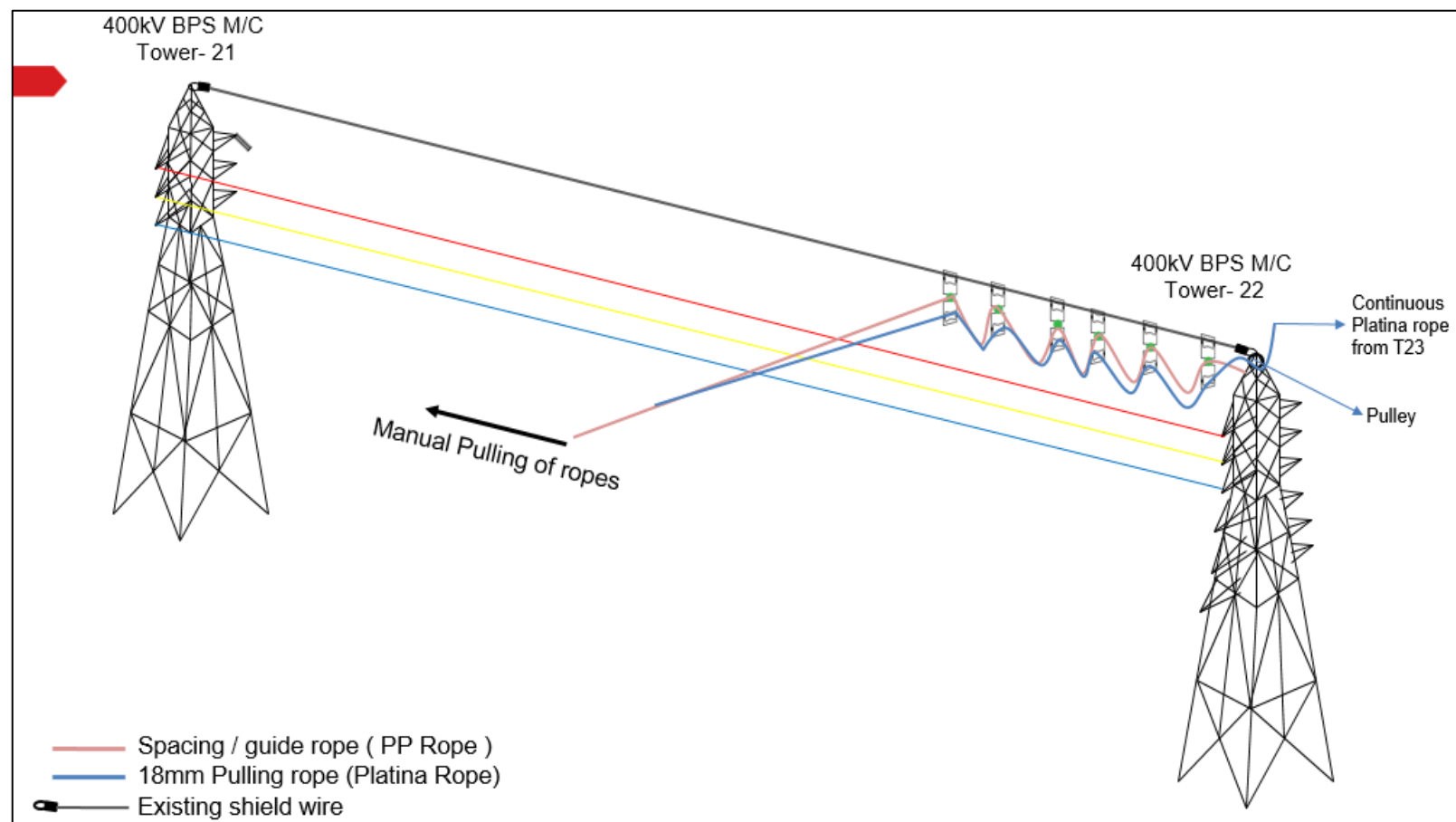
time	Event	Location
16-04-2026 15:24:36	JINDAL 400 CB 41852 (LINE-3 TO BELPS) BETWEEN	JNDL4_KA
16-04-2026 15:24:36	JINDAL 400 CB 40452 (LOAD RJPR4) OPEN	JNDL4_KA
16-04-2026 15:24:36	JINDAL 400 CB 41952 (LINE-4 TO BELPS) OPEN	JNDL4_KA
16-04-2026 15:40:21	BELLARY PS CB TIE 12 - CB 41252 OPEN	BELPS_KA
16-04-2026 15:49:11	BELLARY PS CB TIE 09 - CB 40952 OPEN	BELPS_KA

Deliberations:

1. JSWEL stated that, during antecedent conditions, severe weather with heavy wind, rain and thunderstorms were prevailing in the area. It was further informed that all feeders were in service



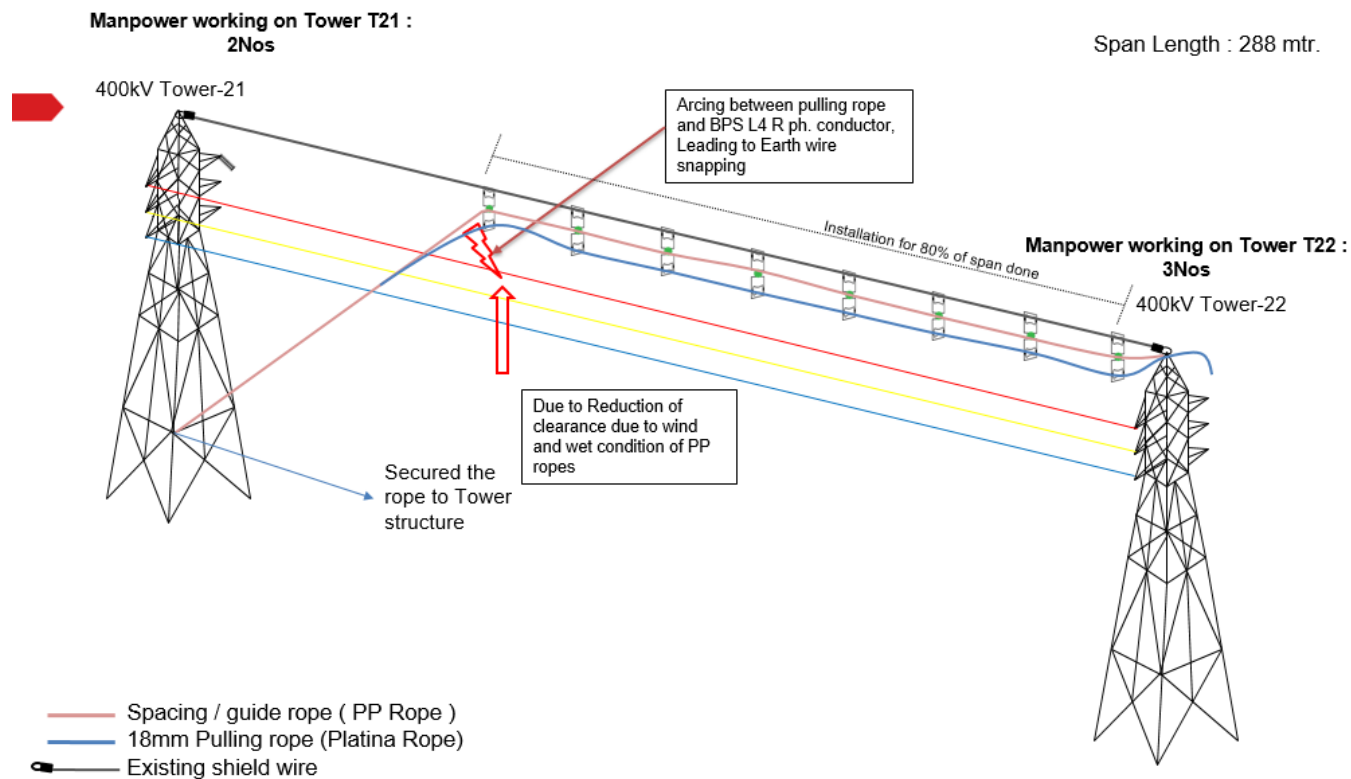
2. JSWEL informed that OPGW installation activities were in progress on the JSW–BPS multi-circuit transmission line. It was stated that Auto Reclosure had been kept out of service at 15:17:22 hrs. Subsequently, during a Zone-1 R-phase fault on JSW–BPS Line-4, Master Trip Relay initiated tripping of the circuit breaker.
3. JSWEL further informed that simultaneously BPS–JSW Line-3 tripped at JSW GIS Substation. The fault current fed from JSW end on Line-4 was around 16.2 kA and the fault distance indicated was around 6.368 km.
4. It was further informed that subsequently the guide rope used for manual roller installation snapped recoiled and came into contact with JSW RE Line-2, resulting in a phase-to-phase fault and tripping of the RE line at 15:22:44 hrs. At 15:22:58 hrs, Zone-1 phase-to-phase fault was detected on JSW–Rajapura RE Line-2 and Master Trip Relay initiated tripping of the circuit breaker. The fault current fed from JSW end on JSW RE Line-2 was around 12.1 kA in Y-phase and 11.91 kA in B-phase with fault distance indication of around 3.23 km.



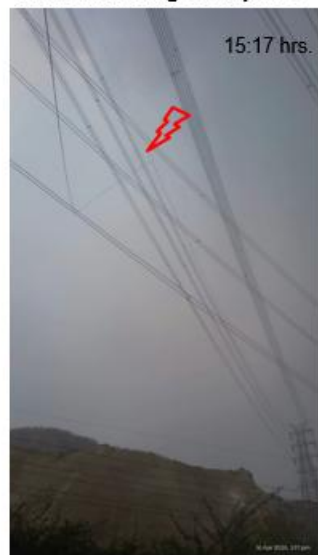
5. JSWEL further informed that, considering the prevailing weather conditions, preparatory OPGW stringing activities had been planned between 09:30 hrs and 15:30 hrs based on learnings from the earlier BPS–YTPS line tripping event dated 13.04.2026.
6. It was stated that OPGW stringing activities between Tower No. 22 and Tower No. 21 commenced at 13:11 hrs under clear weather conditions and manual installation of rollers were started at 13:37 hrs during stable weather conditions.
7. JSWEL informed that at around 14:30 hrs, information regarding adverse weather conditions at the plant location was received. Accordingly, box-up activities were initiated in advance by rescheduling the planned activity closure time from 15:30 hrs to 14:30 hrs. By that time, approximately 80% of the span work, corresponding to around 230 metres, including installation of rollers and associated rope works, had been completed.
8. In line with SOP guidelines and considering the sudden weather deterioration, the ropes used for manual roller installation were secured to the tower structure while maintaining a clearance of approximately 5–6 metres from BPS Line-3. Simultaneously, the guide rope was retracted towards Tower No. 22 to eliminate

loop formation and maintain adequate clearance between the conductor and earth wire circuit.

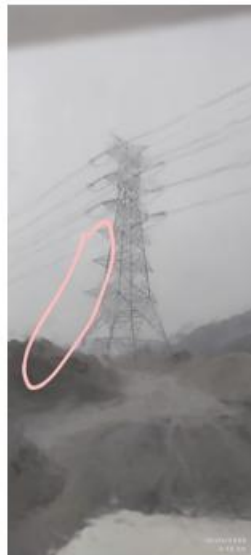
9. JSWEL further informed that at 15:05 hrs light drizzle commenced. Since all ropes had already been secured and necessary clearances maintained, demobilisation of personnel from the towers was initiated at 15:15 hrs to avoid possible electrocution hazards. Subsequently, at 15:17 hrs, the drizzle intensified into heavy rainfall accompanied by gusty winds and thunderstorms. Due to wet conditions, the pilot rope became conductive and at 15:17:44 hrs arcing occurred between the R-phase conductor and the pulling rope (Platina rope), which in turn came into contact with the earth wire of JSWEL–BPS Transmission Line Circuit-2. This resulted in snapping of the earth wire and caused a phase-to-ground fault, leading to tripping of 400 kV JSWEL–BPS Line-4.
10. It was further informed that subsequently the guide rope used for manual roller installation snapped due to the impact, recoiled and came into contact with JSW RE Line-2, resulting in phase-to-phase fault and tripping of the RE Line at 15:22:44 hrs. Since BPS Line-3 remained energised from BPS end and a wet rope was in contact with live conductors, the line was isolated from BPS end as a precautionary measure to avoid possible electrocution of personnel working under the tower.



Post Securing of ropes :



BPS Ckt 2 Earth Wire snap :



P444 : Distance trip Z1 , Fault duration:73.28 , Fault location: 6.368km
IA : 14.08KA, IB: 1.917, IC: 2.028 , Van: 47.27 , Vbn: 216.9, Vcn:
209.2

11. Regarding remedial measures taken, JSWEL informed that SOP for OPGW installation activities had been revised with provision of additional pulley arrangements. It was further informed that a separate team had been constituted for monitoring weather and wind conditions. JSWEL stated that tripping of BPS-JSW Line-3 was being analysed separately under GPR-related issues and detailed investigation report from M/s Manav was awaited.
12. SRLDC highlighted non-receipt of information and reports from RE generators. SRPC requested JSWEL to coordinate with JSW-RE and ensure submission of reports within the timelines specified under IEGC Regulations. JSWEL agreed to the same.

Recommendations:

- ✚ JSW-RE to furnish the DR/ EL regarding the event to SRPC & SRLDC.
- ✚ JSWEL to submit the GPR investigation report from M/s Manav.

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 230kV TTPS Bus-2 of TNPGL	The triggering incident is the Y-G fault in TTPS-Kayathar, where in breaker failed to trip and LBB operated leading to tripping of Bus-2 at TTPS.	17-03-2026 15:15	0	0	GI-1	17-04-2026	16-04-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

The triggering incident is the Y-G fault in TTPS-Kayathar, where in breaker failed to trip and LBB operated leading to tripping of Bus-2 at TTPS.

2. Time and Date of the Event (घटना का समय और दिनांक: 17-03-2026 15:15)

3. Event Category (ग्रिड घटना का प्रकार): GI-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)	17397	17417
TamilNadu State Generation (MW)	8597	8566
Grid Frequency (Hz)	50.06	50.1
SR Demand (MW)	70380	70592
SR Generation (MW)	53540	53449

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

Bus-2 configuration at TTPS

Bus 2 Connected Elements
1. 230KV-KUDANKULAM-TTPS 2. 230KV-KAYATHAR(TN)-TTPS-1 3. TTPS - 230KV - Bus 2

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, 53 minutes

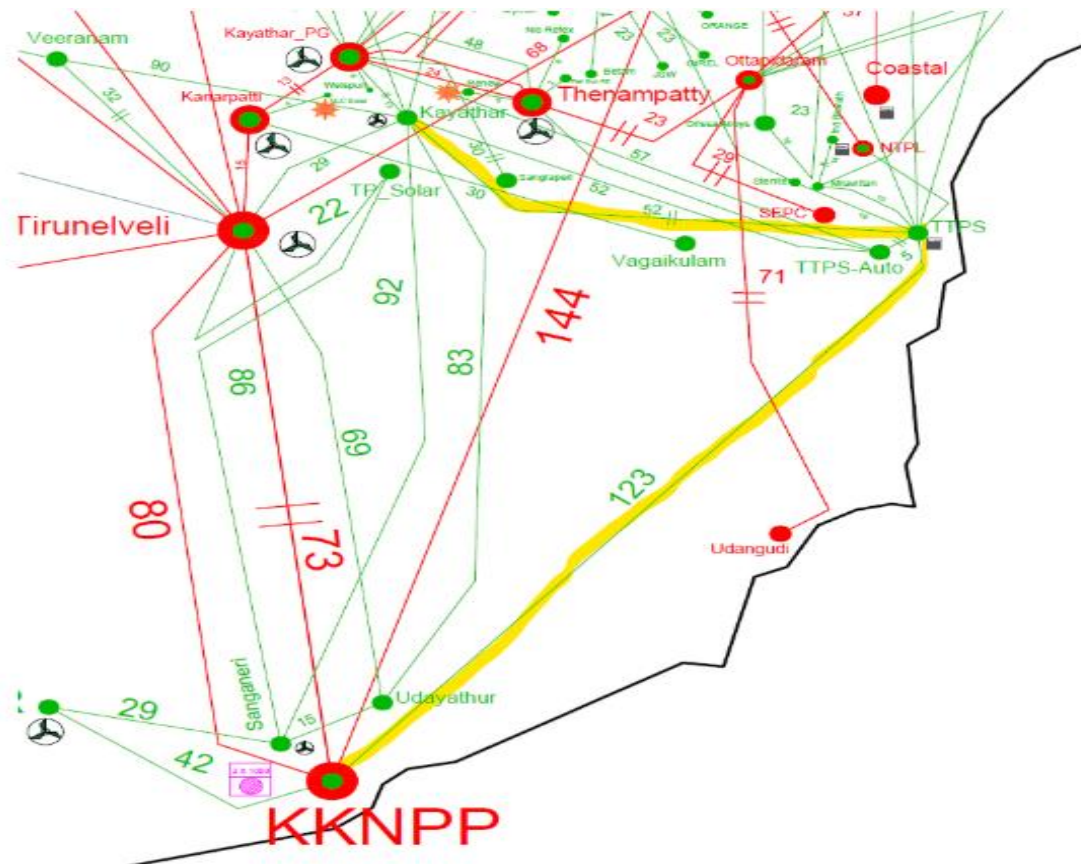
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 230KV-KAYATHAR(TN)-TTPS-1
2. 230KV-KUDANKULAM-TTPS
3. TTPS - 230KV - Bus 2

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

The triggering incident was the fault in Y-ph fault followed by B-ph fault in 230 kV TTPS-Kayathar line where Kayathar line connected to Bus 2 of TTPS station. At Kayathar end, the Y-G fault was sensed in Z1 and Y-pole opened, then after around 200ms within the dead time, the fault developed into B-G fault and 3ph tripped. At TTPS end, the fault was sensed initially in Zone 2 and then Zone 1, but the breaker failed to open due to SF6 contamination (as per FIR). After around 200 ms LBB operated (electromechanical relay) at TTPS end and led to the Tripping of 230kV Bus-2 at TTPS end. DT was sent to Kayathar end but the DT was not sent to KKNP from TTPS.



11. DR Analysis:

TTPS - 230KV

	TTPS - 230KV
Time Sync Issue	No
DR Analysis	No DR uploaded.

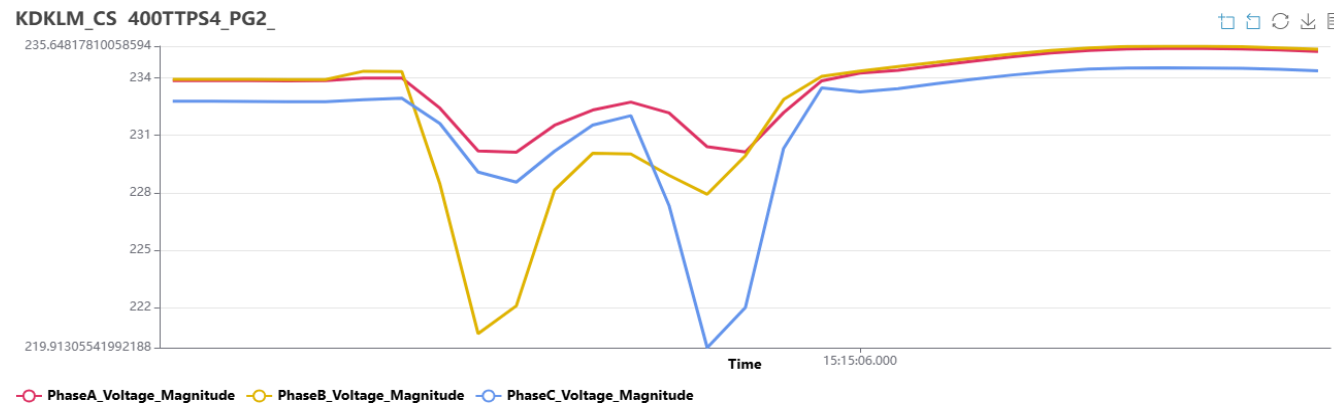
230KV-KAYATHAR(TN)-TTPS-1

	KAYATHAR(TN) - 230KV	TTPS - 230KV
Time Sync Issue	No	No
DR Analysis	DR Trigger Time:17-03-2026 15:15:05.585 Any Trip, Zone 1 B Trip, R2 CONT MX 21Y, R10 CR1 SEND, R11 CR2 SEND CB ARIP L8 PROTN BLOCK L2 CB OPN B Any Pole Dead L14 CR2 RECVD L11 CR1 RECVD Any Trip, Zone 1 C Trip, Aid 1 Dist Trip, R1 CONT MX 21R, R2 CONT MX 21Y, R3 CONT MX 21B, R10 CR1 SEND, R11 CR2 SEND A/R Lockout, R6 M 86A TRIP, R9 M 86B TRIP L8 PROTN BLOCK L13 DT1 RECVD, L15 DT2 RECVD L3 CB OPN C L1 CB OPN A All Poles Dead Ir (max): 1.09 kA Iy (max): 15.33 kA Ib (max): 16.25 kA Vr (max): 144.29 kV Vy (max): 138.27 kV Vb (max): 148.20 kV	DR Trigger Time:17-03-2026 15:15:05.579 Any Start, IN>1 Start T1 DIST Fwd Z2 Any Trip, Any Trip B, DIST. Chan Recv A/R 1P In Prog CB Aux B Any Pole Dead PD INPUT EXT TRIP Y Z1, DIST Sig. Send tBF1 Trip A/R Lockout Any Trip A, Any Trip C, 3P Trip, BAR CB Aux C CB Aux A All Pole Dead tBF2 Trip VN>1 Start DIST. Chan Recv Ir (max): 1.09 kA Iy (max): 4.88 kA Ib (max): 0.84 kA Vr (max): 148.30 kV Vy (max): 134.01 kV Vb (max): 133.33 kV

230KV-KUDANKULAM-TTPS

	KUDANKULAM - 230KV	TTPS - 230KV
Time Sync Issue	No	No
DR Analysis	No DR uploaded. Line Holding.	No DR uploaded.

12. A) PMU Analysis:



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

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

Constituent	Points for review
TNPGCL	1. CB failure at TTPS end needs review

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

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

16. Restoration Details:

17/03/2026 16:08

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)	TNPGCL
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
17-03-2026 15:15:15	TTPS 230 CB COUPLER CB 21652 INVALID	TTPS2_TG
17-03-2026 15:15:15	TTPS 230 CB 20952 (LINE-1 TO KYTR2) BETWEEN	TTPS2_TG
17-03-2026 15:15:17	TTPS 230 CB COUPLER CB 21652 CLOSED	TTPS2_TG
17-03-2026 15:15:27	TTPS 230 CB COUPLER CB 21252 OPEN	TTPS2_TG
17-03-2026 15:15:27	TTPS 230 CB 21052 (LINE TO KDKLM) OPEN	TTPS2_TG
17-03-2026 15:15:27	TTPS 230 CB 20952 (LINE-1 TO KYTR2) OPEN	TTPS2_TG
17-03-2026 15:15:27	TTPS 230 CB 20852 (T2_P) OPEN	TTPS2_TG
17-03-2026 15:15:27	TTPS 230 CB COUPLER CB 20652 OPEN	TTPS2_TG

Detailed Draft Report of grid event submitted by TTPS SS:

Detailed Report

Date of Submission : 16-04-2026 12:40

TTPS - 230KV tripped at 17-03-2026 15:15 and restored at 17-03-2026 16:08

Summary of Event (घटना का सारांश) : For a line fault , Kayathar #1 Y phase limb got failed and fault current did not reduce for more than 200 msec hence 50 LBB operated.All the elements connected in Main bus 2 got tripped.

Time and Date of the event (घटना का समय और दिनांक) : 17-03-2026 15:15

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : TTPS - 230KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GI-1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Single Main and Transfer Bus

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
	1. 230KV-KUDANKULAM-TTPS 2. 230KV-KAYATHAR(TN)-TTPS-1		

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
	3. TTPS - 230KV - Bus 2		

Station Connectivity / SLD during antecedent :

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): False

Reason of tripping : Others

Other Reason : 50 LBB operated in Kayathar #1 which is connected in Main Bus 2 .

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
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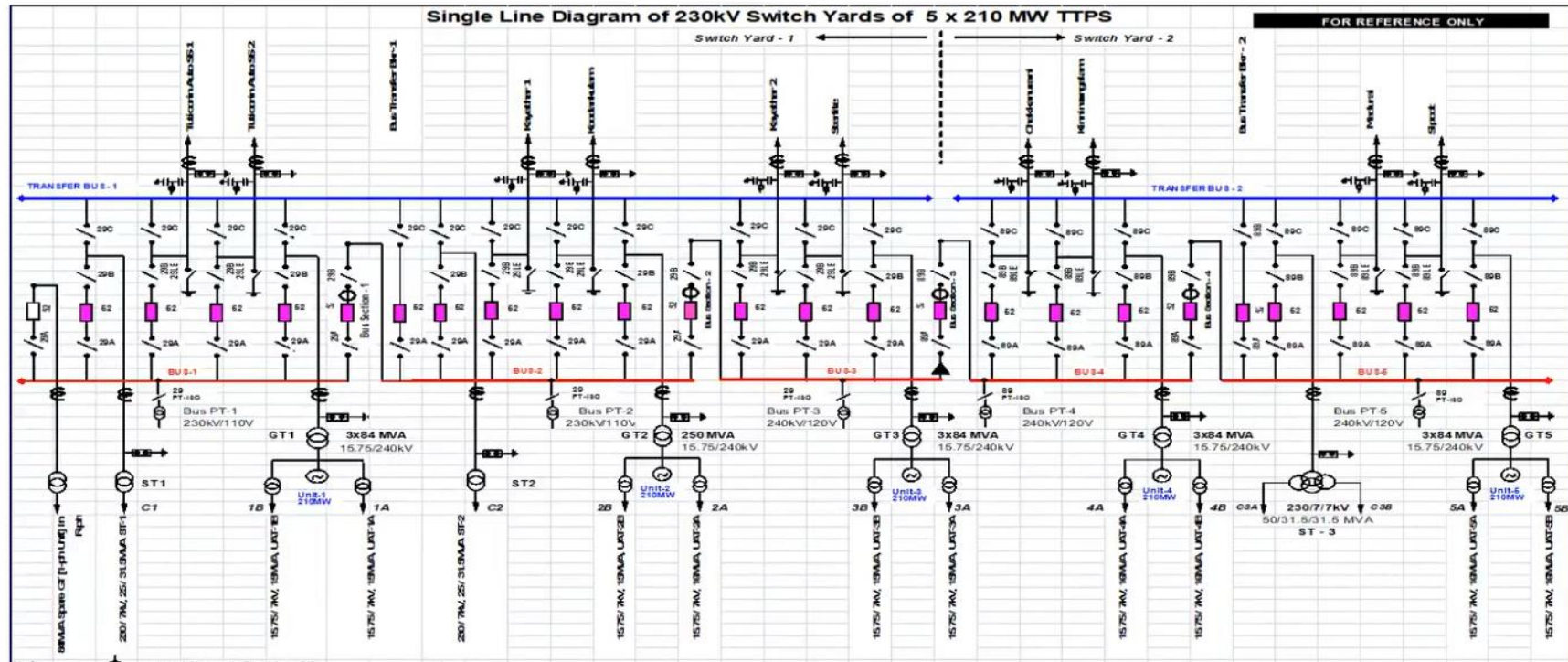
List of elements tripped during the event : 1. 230KV-KAYATHAR(TN)-TTPS-1
2. 230KV-KUDANKULAM-TTPS
3. TTPS - 230KV - Bus 2

Station Connectivity/SLD during the event	:	
Analysis of the event	:	Kayathar #1 Y phase limb got failed for a line fault and fault current did not reduce for more than 200 msec hence 50 LBB operated.All the elements in the Bus 2 got tripped and Bus 2 became dead.
Protection / Operational Issues observed	:	Nil
Restoration Details	:	Bus 2 was energised by closing Bus section 1 breaker at 16.08 hrs on 17.03.2026
DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या)	:	False
Remedial Measures Taken (सुधारात्मक सुझाव)	:	After isolating the Kayathar #1 breaker , Bus 2 was energised through bus section 1 breaker (from Bus 1) at 16.08 hrs and bus section 2 breaker was closed at 16.10 hrs on the same day.
Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	
Main I Relay Indications	:	
Main II Relay Indications	:	
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	
Attachments	:	

Deliberations:

1. TNPGL stated that, under antecedent conditions, all the five main buses, along with four numbers of bus sectionalizers, were in service. It was further informed that Unit-I and Unit-II were not in service due to ongoing revamping works and all ten numbers of 230 kV feeders were in service condition.

SLD OF TTPS



2. TNPGL informed that on 17.03.2026 at 15:15 hrs, 230 kV TTPS–Kayathar Line-1 tripped on Y-phase line fault. It was stated that for the fault in 230 kV Kayathar Line-1 feeder, the Y-phase limb had failed and the fault current did not reduce for more than 200 ms. Consequently, LBB protection operated and all the connected elements on Bus-II tripped.
3. Regarding remedial measures taken, TNPGL informed that the Y-phase limb of 230 kV Kayathar Line-1 feeder was replaced with a spare limb and necessary testing activities had been carried out after erection of the spare limb.
4. SRPC enquired whether LBB retrip operation had occurred during the event. TNPGL confirmed that retrip operation had taken place and the same could be verified from the SOE records.

Sequence of Events

Date / Time	Events
17.03.2026 / 15:15:05:578	Any Start
17.03.2026 / 15:15:05:593	Zone – 2 Pick Start
17.03.2026 / 15:15:05:611	Any Trip / Any Trip Y "ON"
17.03.2026 / 15:15:05:635	CB Aux Y Ph pole Opened
17.03.2026 / 15:15:05:658	Zone – 1 Pick Start
17.03.2026 / 15:15:05:711	Retrip 1 (tBF1)
17.03.2026 / 15:15:05:715	Any Trip R, Y & B / 3Ph Trip ON
17.03.2026 / 15:15:05:751	All Pole dead ON
17.03.2026 / 15:15:05:745	CB Aux B Ph pole Opened
17.03.2026 / 15:15:05:748	CB Aux R Ph pole Opened

5. SRPC further enquired regarding the nature of the fault, as PMU plots indicated two voltage dips in different phases. TNPGL stated that the fault was a single line-to-ground fault only. However, SRLDC observed that the fault had initially started as a Y-phase to ground fault and subsequently evolved into a B-phase to ground fault. SRLDC further stated that the same could be confirmed from the disturbance records at Kayathar end, as three-phase tripping had occurred at Kayathar end due to fault persistence during reclaim time.
6. SRPC enquired regarding the reason for non-transmission of Direct Transfer Trip (DTT) signal to KKNPP line. TNPGL stated that the configuration would be reviewed and the findings would be updated subsequently.

Recommendations:

✚ TNPGL to furnish detailed report regarding non sending of DT to KKNPP end during LBB 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
2	Tripping of 400kV Bus-1 of 400kV Kalaburagi SS	As per the reports submitted, while opening the bus reactor 400kV Bus-1 of Kalaburagi got tripped tripping all elements connected to the 400kV Bus-1	18-03-2026 07:51	0	0	GI-2	13-04-2026	22-04-2026	Not Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

As per the reports submitted, while opening the bus reactor 400kV Bus-1 of Kalaburagi got tripped tripping all elements connected to the 400kV Bus-1

2. Time and Date of the Event (घटना का समय और दिनांक: 18-03-2026 07:51)

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Karnataka State Demand (MW)	14007	14053
Karnataka State Generation (MW)	7414	7414
Grid Frequency (Hz)	50.04	50.05
SR Demand (MW)	60882	60871
SR Generation (MW)	50945	50942

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At Kalaburagi SS:

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-KALABURAGI-YTPS-1 2. 400KV/220KV KALABURAGI-ICT-2	1. 400KV-KALABURAGI-YTPS-2 2. 400KV/220KV KALABURAGI-ICT-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 (रूकावट 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. KALABURAGI - 400KV - Bus 1

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

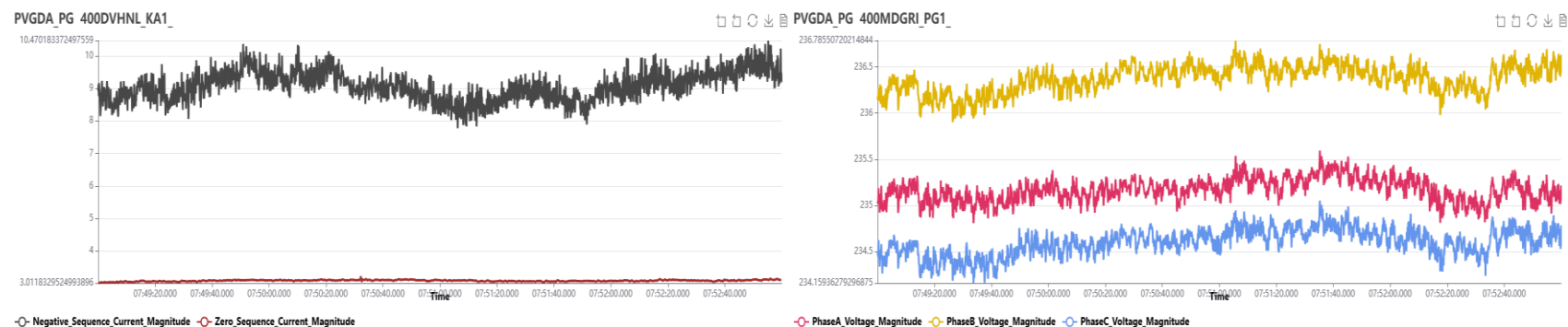
As per the reports submitted, while opening the bus reactor 400kV Bus-1 of Kalaburagi got tripped tripping all elements connected to the 400kV Bus-1

11. DR Analysis:

KALABURAGI - 400KV

	KALABURAGI - 400KV
Time Sync Issue	No
DR Analysis	No DR was uploaded

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
KPTCL	1. Reason for tripping of 400kV Bus-1 while hand tripping the Bus reactor

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

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

16. Restoration Details:

YTPS line 1,2 charged at 08:08hrs and 08:23 hrs respectively and ICT-2 charged at 08:24 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)	KPTCL
4	Any other non-compliance	IEGC section 17.3	

18. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
18-03-2026 07:48:02	KALBURGI 400 CB TIE 06 - CB 40652 OPEN	KLBRG_KA
18-03-2026 07:50:00	KALBURGI 400 CB TIE 13 - CB 41352 OPEN	KLBRG_KA
18-03-2026 07:50:05	KALBURGI 400 CB 21052 (LINE-2 TO SHAPR) OPEN	KLBRG_KA

Detailed Draft Report of grid event submitted by KALABURAGI SS:

Detailed Report

Date of Submission : 22-04-2026 11:31

KALABURAGI - 400KV tripped at 18-03-2026 07:51 and restored at 18-03-2026 08:08

Summary of Event (घटना का सारांश) : On 400kV side YTPS line-1 and 500MVA ICT-1 were in charged condition. YTPS line-2 and 500MVA ICT-2 were yet to be restored .

At 7.51 Hrs when SLDC given instruction to open the 125 MVAR Bus reactor both main and tie breakers were hand tripped at 400kV Kalburgi. With this Tie between Bus A and Bus B was lost. YTPS line -1 connected to Bus A was in charged condition. no load was interrupted as 220kV bus was in charged condition.

Further normalcy of the substation ws restored, YTPS1,2 restored at 08:08hrs and 08:23 hrs respectively and ICT-2 charged at 08:24 hrs.

Time and Date of the event (घटना का समय और दिनांक) : 18-03-2026 07:51

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : KALABURAGI - 400KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GI-2

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 400KV-KALABURAGI-YTPS-1 2. 400KV/220KV KALABURAGI-ICT-2	1. 400KV-KALABURAGI-YTPS-2 2. 400KV/220KV KALABURAGI-ICT-1		

Station Connectivity / SLD during antecedent :

Weather Conditions : Cloudy

Elements under outage prior to the event : 1. 400KV-KALABURAGI-YTPS-2
2. 400KV/220KV KALABURAGI-ICT-2

Other Information (Antecedent Cnditions) : Bus reactor main and Tie CBs hand tripped while opening the Bus Reator

Renewable Energy Trip : False

Details of SPS Operation (if any): False

Reason of tripping : Others

Other Reason : while opening Bus reactor at 400kV Kalburgi Bus A got dead resulting in tripping of YTPS line -1

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption (रुकावट की अवधि) :

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
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List of elements tripped during the event : 1.

Station Connectivity/SLD during the event :

Analysis of the event : at 7:51 hrs while opening Bus reactor at tie between 400kV Kalburgi Bus A and Bus B was tripped . no load was interrupted as 220kV bus was in charged condition

Protection / Operational Issues observed : Nil

Restoration Details : YTPS line 1,2 charged at 08:08hrs and 08:23 hrs respectively and ICT-2 charged at 08:24 hrs.

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) : YTPS line 1,2 charged at 08:08hrs and 08:23 hrs respectively and ICT-2 charged at 08:24 hrs.

Relay/PLCC Operation Details :

Control Panel Anunciation : NA

Main I Relay Indications : No

Main II Relay Indications : No

Other Relay Indications : NO

PLCC Counter Increment I/T : NA

PLCC Counter Increment D/T : NA

Fault Current Value (kAmp) : 0.0

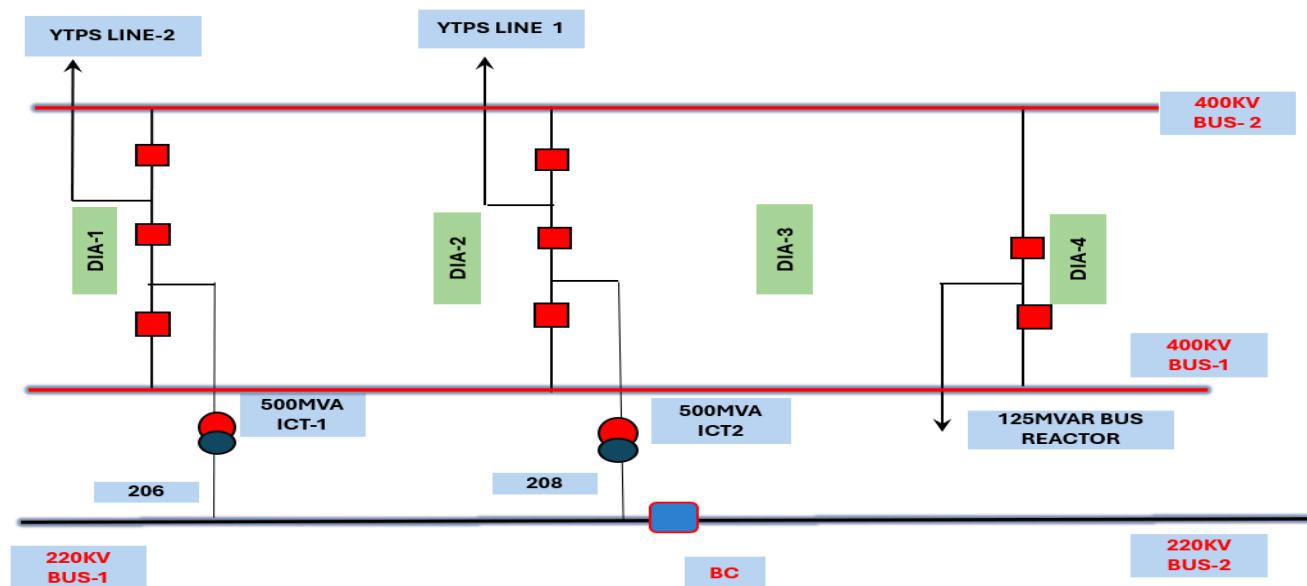
LA Counter : NIL

Remarks :

Attachments :

Deliberations:

1. Bus configuration at KALABURGI 400/220kV SS as follows:



2. KPTCL informed that in the antecedent conditions at Kalaburgi, on 400kV side YTPS line-1, 500MVA ICT-1 & 125 MVAR bus reactor were in service and YTPS line-2 and 500MVA ICT-2 were yet to be restored (Tripped on 17.03.2026 at 21.52 Hrs).
3. YTPS line-1 was tripped at 07.47 hrs (before the incident) due failure of the voltage selection circuit of both the relays.
4. KPTCL further informed that as the YTPS line-2 was yet to be restored, only tie between bus 1 & 2 was through the bus reactor bay.
5. On 18.03.2026 at 7.51 Hrs, to open the 125MVAR Bus Reactor, as per SLDC instructions, Bus reactor main and Tie CBs were hand tripped.
6. With the opening of the only tie connection (Bus Reactor Bay) between Bus-A and Bus-B, 400 kV Bus-A got de-energized. However, no load interruption occurred, as the 220 kV bus remained in charged condition. Subsequently, normalcy of the substation was restored.
7. Kalaburgi YTPS line 1,2 were restored at 08:08hrs and 08:23 hrs on 18.03.2026 respectively and ICT-2 charged at 08:24 hrs on 18.03.2026.
8. SRPC enquired why this event was classified as GI, as manual opening of breaker was done and line tripped 5 minutes prior to the event, hence it can be classified as a single tripping event. SRLDC stated that due to non receipt of DR they were unable to establish the event.

Recommendations:

KPTCL to follow SOP during testing and maintainance activities.

S. No .	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
3	Tripping of 220kV Bus-2 at Idduku PH of KSEB	As per the reports submitted, the triggering incident was B-G fault in 220kV Bus-2 of Idukki PH. Immediately, 220kV Bus-2 BBP operated and all elements connected to the Bus-2 tripped.	18-03-2026 15:26	102	0	GI-1	30-03-2026	23-03-2026	Considered

Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

Tripping of IDDUKI - 220KV

2. Time and Date of the Event (घटना का समय और दिनांक: 18-03-2026 15:26

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Kerala State Demand (MW)	3959	3962
Kerala State Generation (MW)	919	810
Grid Frequency (Hz)	49.91	49.92
SR Demand (MW)	65843	65658
SR Generation (MW)	56031	55695

**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)
102.0 MW	0.0 MW

7. Duration of interruption (रूकावट की अवधि): 1 hours, 0 minutes

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

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

1. 220KV-IDDUKI-KALAMASSERY-2
2. 220KV-IDDUKI-KOTHAMANGALAM-1
3. 220KV-LOWER PERIYAR-IDDUKI-2

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

As per the reports submitted, the triggering incident was a flashover of the R-phase Line PT of 220kV Idukki Kalamassery Line-2, located within the Bus Bar protection zone at the Idukki 220 kV switchyard. Consequently, the 220kv Bus-2 BBP correctly detected this as an internal fault, leading to the operation of Bus Bar Zone-2 protection and tripping of all elements connected to Bus No. 2.

It is further submitted that 220kV Idukki PH is an aged generating station, where the existing switchyard configuration has PTs installed ahead CTs, thereby inherently placing them within the protected zone of the Bus Bar protection scheme.

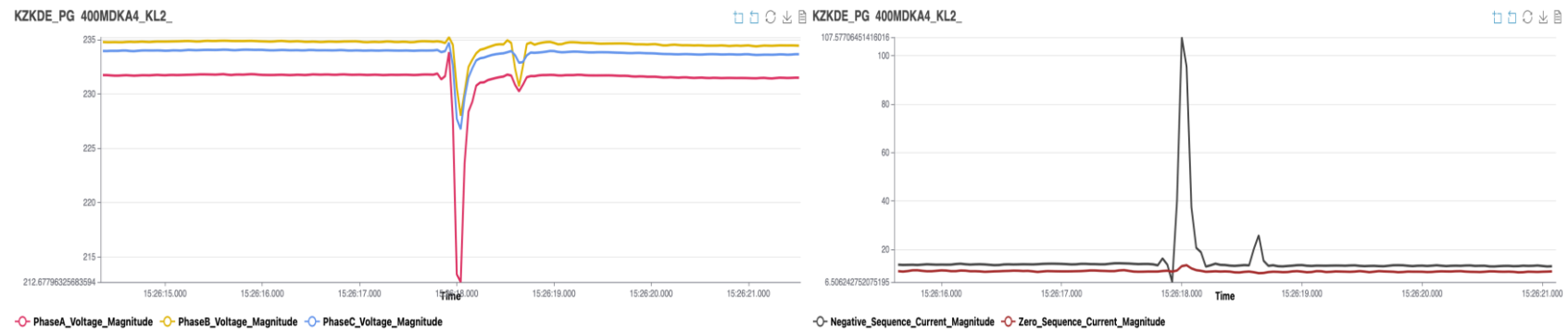
In view of space constraints, existing layout limitations, and operational considerations, relocation or modification of the PT placement is presently not feasible without undertaking major switchyard reconfiguration.

11. DR Analysis:

IDDUKI - 220KV

	IDDUKI - 220KV
Time Sync Issue	No
DR Analysis	<p>DR Trigger Time:18-03-2026 15:26:17.987</p> <p>Any Start</p> <p>L1-DT SEND CH-1, L2-DT SEND CH-2</p> <p>DIST Rev, DIST Start A</p> <p>Z4</p> <p>DIST. Chan Recv</p> <p>Any Start</p> <p>DIST Rev, Z4, DIST Start B</p> <p>DIST. Chan Recv</p> <p>Ir (max): 2.91 kA Iy (max): 3.15 kA Ib (max): 0.21 kA</p> <p>Vr (max): 223.89 kV Vy (max): 146.34 kV Vb (max): 149.04 kV</p>

12. A) PMU Analysis:



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

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

Constituent	Points for review
KSEB	1. Reason for PT flashover

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

Sl. No	Element	Trip Time	Restoration Time	Remarks
1	2IDKM	15:26	16:34	PT flash
2	2IDL-2	15:26	16:26	PT flash
3	2IDKL-2	15:26	20.03.2026, 01:57	PT replaced
4	Generator Unit #2	15:26	16:06(Reserve Shutdown)	PT flash

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)	KSEBL
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	KSEBL

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
18-03-2026 15:26:23	IDUKKI CB CB 20652 (GT-2) OPEN	IDKI2_KL
18-03-2026 15:26:23	IDUKKI CB 20852 (LINE -2 TO KLSY2) OPEN	IDKI2_KL
18-03-2026 15:26:23	IDUKKI CB 20952 (LINE TO KMLM2) OPEN	IDKI2_KL
18-03-2026 15:26:23	IDUKKI CB 21452 (LINE -2 TO LPYR2) OPEN	IDKI2_KL
18-03-2026 15:26:23	IDUKKI CB COUPLER CB 20352 OPEN	IDKI2_KL

Detailed Draft Report of grid event submitted by IDDUKI SS:

Detailed Report

Date of Submission : 23-03-2026 11:09

IDDUKI - 220KV tripped at 18-03-2026 15:26 and restored at 18-03-2026 15:26

Summary of Event (घटना का सारांश) : A Bus Bar Zone-2 protection operation occurred at the 220 kV switchyard of Idukki HEP, resulting in tripping of multiple feeders and one generating unit. The disturbance was initiated due to a **flashover in the R-phase Line Potential Transformer (PT) of feeder 220kV Idukki kalamassery 2 feeder** on 18-03-2026 at 15:26 hrs.

Time and Date of the event (घटना का समय और दिनांक) : 18-03-2026 15:26

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : IDDUKI - 220KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GI-1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 220KV-IDDUKI-KALAMASSERY-1 2. 220KV-IDDUKI-NEW-PALLOM-1 3. 220KV-IDDUKI-Pallivasal-1 4. 220KV-LOWER PERIYAR-IDDUKI-1	1. 220KV-IDDUKI-KALAMASSERY-2 2. 220KV-IDDUKI-KOTHAMANGALAM-1 3. 220KV-LOWER PERIYAR-IDDUKI-2		

Station Connectivity / SLD during antecedent :

- Bus: Bus No. 2

- **Connected Elements:**
 - Generator Unit #2
 - 2IDKM feeder
 - 2IDKL-2 feeder
 - 2IDL-2 feeder

- Bus: Bus No. 1

- **Connected Elements:**
 - Generator Unit #1
 - Generator Unit #3
 - Generator Unit #5
 - 2IDPES feeder
 - 2IDKL-1 feeder
 - 2IDL-1 feeder
 - 2IDNP-1 feeder
 - 50MVA, 220/110kV Transformer

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) :

- At 15:26 hrs, R-phase Line PT of 2IDKL-2 flashed.
- Fault occurred before CT location (PT installed before CT).
- Bus Bar protection detected the fault.
- Zone-2 Bus Bar protection operated.

- Following elements tripped simultaneously:
 - 3 feeders (2IDKM, 2IDL-2, 2IDKL-2)
 - Generator Unit #2

- The Line Potential Transformer (PT) of feeder 2IDKL-2 is located within the Bus Bar protection zone at Idukki 220 kV switchyard. Hence, the flashover of the R-phase PT was correctly detected as an internal fault by the Bus Bar protection scheme, resulting in the operation of Bus Bar Zone-2 protection and tripping of all elements connected to Bus No. 2.

It is also submitted that Idukki HEP is an old generating station, where the existing

switchyard layout has PTs installed ahead of the CTs, placing them inherently within the protected zone of the Bus Bar scheme.

Due to space constraints, existing layout limitations, and operational constraints, relocation or modification of PT placement is not feasible at present without major switchyard reconfiguration.

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : LLG

phases inv : None, None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : None

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
102 MW	0 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment Failure (if any during the event):

Equipment Type	Equipment Make
PT	M/s. SCT Ltd,

List of elements tripped during the event :
1. 220KV-IDDUKI-KALAMASSERY-2
2. 220KV-IDDUKI-KOTHAMANGALAM-1
3. 220KV-LOWER PERIYAR-IDDUKI-2

Station Connectivity/SLD during the event :

Analysis of the event : A Bus Bar Zone-2 protection operation occurred at the 220 kV switchyard of Idukki HEP, resulting in tripping of multiple feeders and one generating unit. The disturbance was initiated due to

a flashover in the R-phase Line Potential Transformer (PT) of feeder 220kV Idukki kalamassery 2 feeder on 18-03-2026 at 15:26 hrs. The Line Potential Transformer (PT) of feeder 2IDKL-2 is located within the Bus Bar protection zone at Idukki 220 kV switchyard. Hence, the flashover of the R-phase PT was correctly detected as an internal fault by the Bus Bar protection scheme, resulting in the operation of Bus Bar Zone-2 protection and tripping of all elements connected to Bus No. 2.

It is also submitted that Idukki HEP is an old generating station, where the existing switchyard layout has PTs installed ahead of the CTs, placing them inherently within the protected zone of the Bus Bar scheme.

Due to space constraints, existing layout limitations, and operational constraints, relocation or modification of PT placement is not feasible at present without major switchyard reconfiguration.

220 kV Idukki - Kalamassery #2 (2IDKL#2) & 220 kV Idukki - Kothamangalam (2IDKM) feeders are tripped at both ends at 15:26 hrs on 18.03.2026, along with Idukki unit # 2 machine. 220 kV Idukki - Lower Periyar #2 (2IDLP#2) at Idukki end & 220 kV Idukki - Pallivasal Extension (2IDPES) at PES end are also tripped at the same time. No supply interruption. 220 kV PT flashing reported on 2IDKL feeder at Idukki end . 2IDLP#2 feeder charged at 16:26 hrs, 2IDPES feeder charged at 16:29 hrs & 2IDKM feeder charged at 16:34 hrs.

The disturbance was primarily caused by the failure of the Line PT, and the subsequent Bus Bar protection operation was correct and as per design philosophy, considering the PT lies within the protection zone.

Protection / Operational Issues observed : Nil

Restoration Details	Sl. No	Element	Trip Time	Restoration Time	Remarks
	1	2IDKM	15:26	16:34	PT flash
	2	2IDLP-2	15:26	16:26	PT flash
	3	2IDKL-2	15:26	20.03.2026, 01:57	PT replaced
	4	Generator Unit #2	15:26	16:06(Reserve Shutdown)	PT flash

DR Time synchronization issues observed (सुरक्षा/ प्रचालन समस्या) : False

Remedial Measures Taken (सुधारात्मक सुझाव) :

2IDL#2 feeder charged at 16:26 hrs, 2IDPES feeder charged at 16:29 hrs & 2IDKM feeder charged at 16:34 hrs.

Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	
Main I Relay Indications	:	VT fuse fail, Carrier send,
Main II Relay Indications	:	IA=0A,IB=2.769A,IC=0.00A,VAN=31.29KV,VBN=5.129KV,VCN=14
Other Relay Indications	:	Feeders / Generators associated with Bus #2 suddenly tripped at both moolamattom and corresponding substation end
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	None
LA Counter	:	
Remarks	:	All stations normalised. 2IDKL-2 PT Replaced on 20.03.2026, @ 01:57 feeder charged.
Attachments	:	

Deliberations:

1. KSEBL presented the bus arrangements prevailing prior to the event at Idukki HEP switchyard:

Bus arrangements.

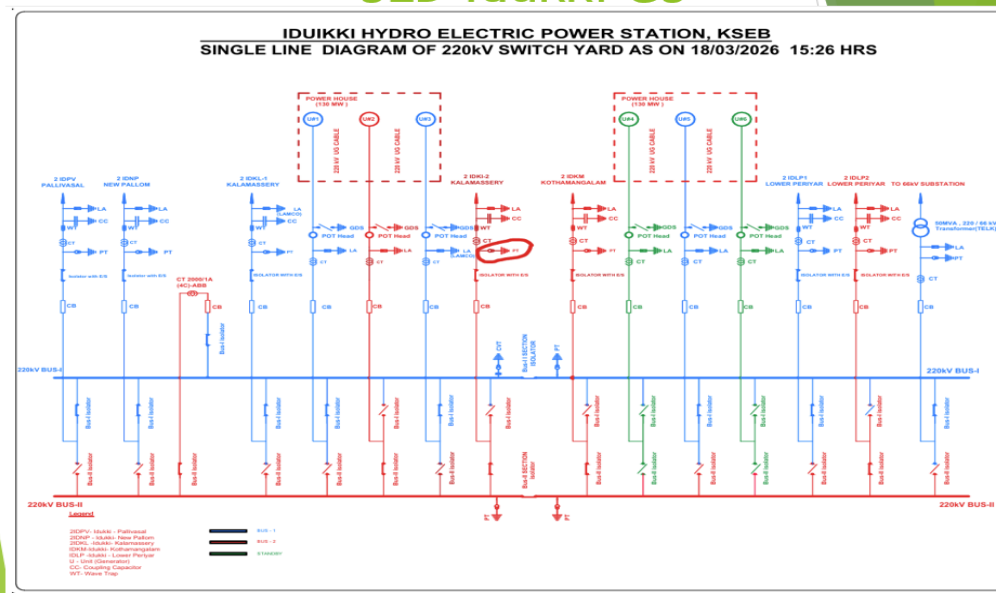
Bus: Bus No. 2

- I. Generator Unit #2
- II. 2IDKM feeder
- III. 2IDKL-2 feeder
- IV. 2IDL-2 feeder

Bus: Bus No. 1

- I. Generator Unit #1
- II. Generator Unit #3
- III. Generator Unit #5
- IV. 2IDPES feeder
- V. 2IDKL-1 feeder
- VI. 2IDL-1 feeder
- VII. 2IDNP-1 feeder
- VIII. 50MVA, 220/110kV Transformer

SLD Idukki GS



2. KSEBL stated that Bus Bar Zone-2 protection operation occurred at the 220 kV switchyard of Idukki HEP, resulting in tripping of multiple feeders along with one generating unit. It was informed that the disturbance was initiated due to flashover in the R-phase Line Potential Transformer (PT) of 220 kV Idukki–Kalamassery-2 feeder on 18.03.2026 at 15:26 hrs.
3. KSEBL further informed that the Line Potential Transformer of feeder 2IDKL-2 was physically located within the Bus Bar Protection zone at Idukki 220 kV switchyard. Hence, flashover of the R-phase PT had been correctly detected as an internal fault by the Bus Bar Protection scheme, resulting in operation of Bus Bar Zone-2 protection and tripping of all elements connected to Bus No. 2. It was further informed that Direct Transfer Trip (DTT) signals had also been transmitted to the remote ends.
4. KSEBL submitted that Idukki HEP is an old generating station; the existing switchyard layout has PTs installed ahead of the CTs, thereby inherently placing them within the protected zone of the Bus Bar Protection scheme. It was further informed that due to space constraints, existing layout limitations and operational constraints, relocation or modification of PT placement was presently not feasible without major switchyard reconfiguration.

SCT Make PT Sl No. 2015/1706



5. Remedial Action taken:

- All stations normalised. 2IDKL-2 PT Replaced on 20.03.2026, @ 01:57 feeder charged
- Subsequent to the above incident, two Potential Transformers (PTs) in the R phase and Y phase of the 220 kV Idukki–Kalamassery Feeder No. 2 were replaced.

- The Idukki PES feeder experienced a trip at the PES end due to the 'Switch-On-To-Fault (SOTF) Initiation Input' remaining in high status. The abnormal condition was subsequently identified, rectified, and the normal operation of the input had been verified.

6. SRPC requested KSEBL to report equipment failure to CEA.

Recommendations:

 **KSEBL to report equipment failure to CEA.**

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 Doni S of KPTCL	As per the reports submitted, the triggering incident was B-G fault in 400kV Bus-2 due to B-phase limb flashover during Bus reactor CB operation. Immediately, 400kV Bus-2 BBP operated and all main breakers connected to 400kV Bus-2 tripped resulting in loss of power supply to 400kV Dhoni Bus-2. It is reported that the Tie breaker of 400kV/220kV Dhoni ICT-1 was hand tripped by the shift engineer during fault. This led to the loss of power supply to tripping of 400kV/220kV Dhoni ICT-1.	20-03-2026 08:01	0	0	GI-2	28-03-2026	21-03-2026	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 B-G fault in 400kV Bus-2 due to B-phase limb flashover during Bus reactor CB operation. Immediately, 400kV Bus-2 BBP operated and all main breakers connected to 400kV Bus-2 tripped resulting in loss of power supply to 400kV Dhoni Bus-2.
It is reported that the Tie breaker of 400kV/220kV Dhoni ICT-1 was hand tripped by the shift engineer during fault. This led to the loss of power supply to tripping of 400kV/220kV Dhoni ICT-1.

2. Time and Date of the Event (घटना का समय और दिनांक: 20-03-2026 08:03

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Condition	Pre-Event (घटना पूर्व)	Post Event (घटना के बाद)
Karnataka State Demand (MW)	13125	13170
Karnataka State Generation (MW)	6667	6825
Grid Frequency (Hz)	50.05	50.02
SR Demand (MW)	58069	58290
SR Generation (MW)	45939	46300

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At 400kV Doni SS:

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-DONI-GUTTUR-1 2. 400KV-DONI-MUNIRABAD-1 3. 400KV/220KV DONI-ICT-1 4. 400KV/220KV DONI-ICT-2	1. 400KV-DONI-GUTTUR-1 2. 400KV-DONI-MUNIRABAD-1 3. 400KV/220KV DONI-ICT-1 4. 400KV/220KV DONI-ICT-2

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

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

Duration of interruption (रुकावट की अवधि): 1 hours, 35 minutes

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

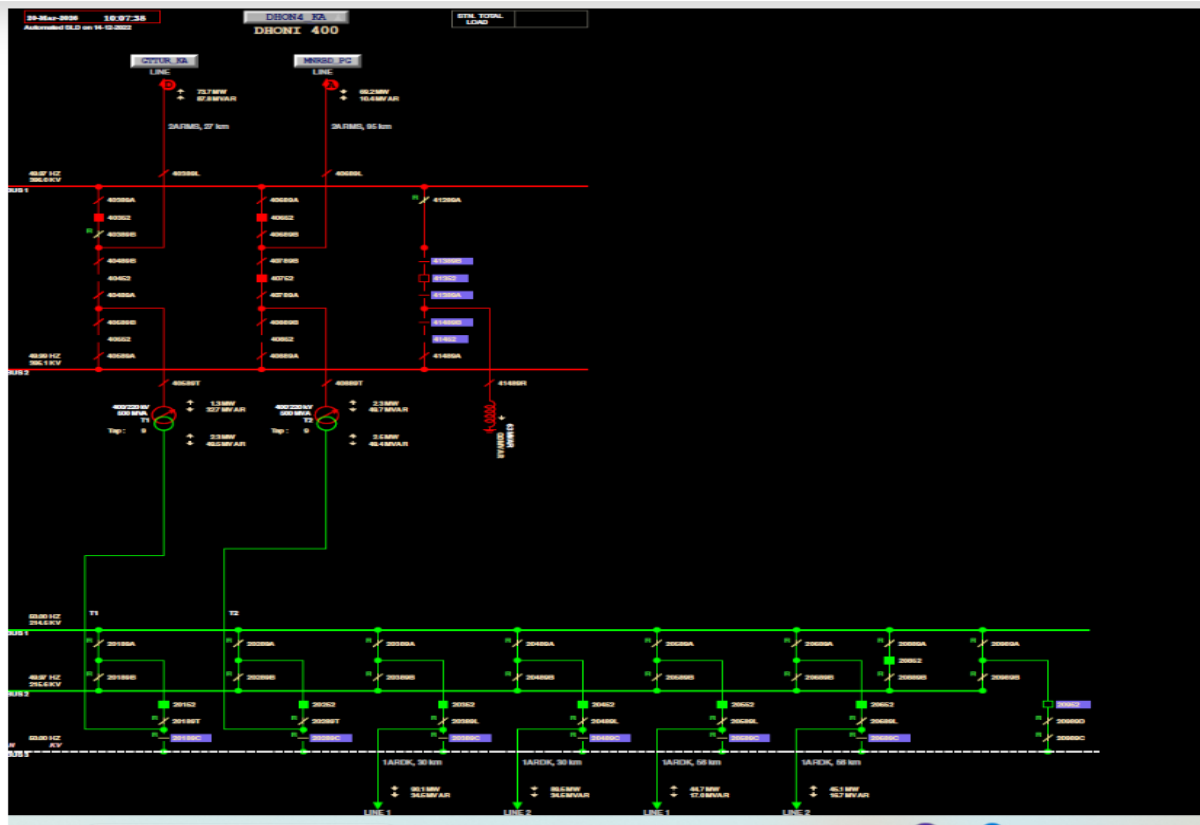
8. List of Elements got tripped during event (प्रमुख ट्रिपिंग)

1. DONI - 400KV - Bus 2
2. 400KV/220KV DONI-ICT-1

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

As per the reports submitted, the triggering incident was B-G fault in 400kV Bus-2 due to B-phase limb flashover during Bus reactor CB operation. Immediately, 400kV Bus-2 BBP operated and all main breakers connected to 400kV Bus-2 tripped resulting in loss of power supply to 400kV Dhoni Bus-2.

It is reported that the Tie breaker of 400kV/220kV Dhoni ICT-1 was hand tripped by the shift engineer during fault. This led to the loss of power supply to tripping of 400kV/220kV Dhoni ICT-1.



10. DR Analysis:

400KV/220KV DONI-ICT-1

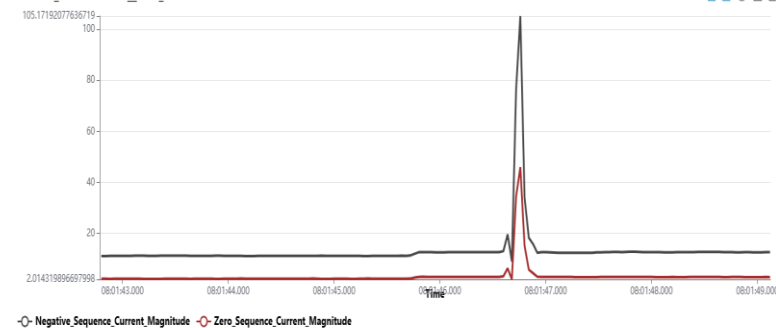
	DONI - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:20-03-2026 08:01:46.728 Device trip G, Trip L3 G, Trip BBP G BUS2 BB OP DR Trigger Time:20-03-2026 08:01:46.731 Device trip G, Trip L3 G, Trip BBP G, Trip B2 L3 BUS2 BB OP

DONI - 400KV

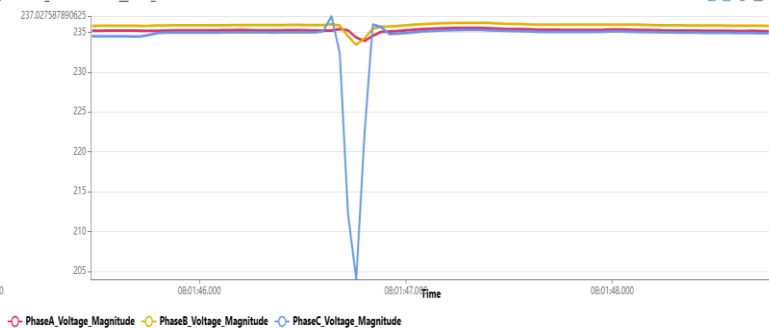
	DONI - 400KV
Time Sync Issue	No
DR Analysis	DR Trigger Time:20-03-2026 08:01:46.728 Device trip G, Trip L3 G, Trip BBP G BUS2 BB OP DR Trigger Time:20-03-2026 08:01:46.731 Device trip G, Trip L3 G, Trip BBP G, Trip B2 L3 BUS2 BB OP

A) PMU Analysis:

GTTUR_KA_400BTPS_KA1_



GTTUR_KA_400BTPS_KA1_



From PMU voltage at 400kV Guttur, dip in B-pole is observed indicating B-G fault during the event with no delayed fault clearance.

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

Constituent	Points for review
KPTCL	1. Reason for Bus reactor breaker limb flashover. 2. Hand tripping of Tie breaker of 400kV/220kV Dhoni ICT-1

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

Constituent	Remedial Actions
KPTCL	Isolated the faulty section of Bus Reactor Bay and charged the 400kV bus-2 and ICT-1. Need to replace the faulty breaker.

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

14. Restoration Details:

DONI - 400KV tripped at 20-03-2026 08:03 and restored at 20-03-2026 09:38

15. 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	

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
20-03-2026 08:06:06	DHONI 400 CB TIE 05 - CB 40552 OPEN	DHON4_KA
20-03-2026 08:06:06	DHONI 400 CB TIE 08 - CB 40852 OPEN	DHON4_KA
20-03-2026 08:06:06	DHONI 400 CB TIE 14 - CB 41452 OPEN	DHON4_KA
20-03-2026 08:06:06	DHONI 400 CB TIE 04 - CB 40452 OPEN	DHON4_KA
20-03-2026 09:36:02	DHONI 400 CB TIE 04 - CB 40452 CLOSED	DHON4_KA
20-03-2026 09:37:45	DHONI 400 CB TIE 05 - CB 40552 CLOSED	DHON4_KA
20-03-2026 09:38:08	DHONI 400 CB TIE 08 - CB 40852 CLOSED	DHON4_KA

Detailed Draft Report of grid event submitted by DONI SS:

Detailed Report

Date of Submission : 21-03-2026 08:12

DONI - 400KV tripped at 20-03-2026 08:03 and restored at 20-03-2026 09:38

Summary of Event (घटना का सारांश) :

On 20.03.2026 at 08:01:46 hrs during bus reactor CB operation (414-52), B-phase limb flashover occurred. This created a fault seen by busbar protection and Busbar protection operated and issued trip. So 400kV Bus-2 completely dead. Shift Engineer manually tripped the Tie breaker (404-52) of ICT-1 as a precautionary measure to prevent possible fault feeding and to safeguard equipment's under abnormal system conditions.

Time and Date of the event : 20-03-2026 08:03
(घटना का समय और दिनांक)

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : DONI - 400KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GI-2

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

Configuration of Bus (HV/LV) :
Along with details of Bus split Operation (if any)

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 400KV-DONI-GUTTUR-1 2. 400KV-DONI-MUNIRABAD-1 3. 400KV/220KV DONI-ICT-1 4. 400KV/220KV DONI-ICT-2	1. 400KV-DONI-GUTTUR-1 2. 400KV-DONI-MUNIRABAD-1 3. 400KV/220KV DONI-ICT-1 4. 400KV/220KV DONI-ICT-2		

Station Connectivity / SLD :
during antecedent

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Conditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Protection coordination

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption :
(रुकावट की अवधि)

Details of Equipment :
Failure (if any during the event):

Equipment Type	Equipment Make
CB	Siemens

List of elements tripped during the event :
1. DONI - 400KV - Bus 2
2. 400KV/220KV DONI-ICT-1

Station Connectivity/SLD during the event :

Analysis of the event :
On 20.03.2026 at 08:01:46 hrs during bus reactor CB operation (414-52), B-phase limb flashover occurred. This created a fault seen by busbar protection and Busbar protection operated and issued trip. So 400kV Bus-2 completely dead. Shift Engineer manually tripped the Tie breaker (404-52) of ICT-1 as a precautionary measure to prevent possible fault feeding and to safeguard equipments under abnormal system condition.

Protection / Operational Issues observed :

Restoration Details :
Restored after isolating faulty section of Bus-2

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) :
False

Remedial Measures Taken (सुधारात्मक सुझाव) :
Isolated the faulty section of Bus Reactor bay and charged the 400kV bus-2 and ICT-1.
Need to replace the faulty breaker.

Relay/PLCC Operation Details :

Control Panel Anunciation :

Main I Relay Indications :

Main II Relay Indications :

Other Relay Indications : Master control Unit-1 & 2

PLCC Counter Increment I/T :

PLCC Counter Increment D/T :

Fault Current Value (kAmp) : None

LA Counter :

Remarks :

Attachments : 1. [Others](#)

Deliberations:

1. KPTCL stated that, under pre-fault conditions on 20.03.2026, all elements were in service with all main and tie circuit breakers in closed condition.
2. KPTCL informed that at 08:01:46 hrs, while opening the bus reactor as per SLDC instructions, B-phase limb of Main Circuit Breaker-414 failed, resulting in a bus fault. Consequently, Bus-2 Busbar Protection operated and all main breakers connected to Bus-2 got tripped. It was further informed that the tie breaker (404-52) of the 63 MVAR bus reactor was already in open condition at that time.
3. KPTCL further stated that the tie circuit breaker (404-52) of ICT-1 was manually tripped by the shift operator under panic situation. It was informed that all the remaining elements remained healthy and intact.
4. Regarding remedial measures taken, KPTCL informed that replacement work of the failed circuit breaker limb using the spare limb available at site was under progress. It was further informed that deputation of OEM personnel was awaited.
5. KPTCL to ensure strict adherence to SOPs by field personnel even during emergency and contingency conditions.

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 230kV Karaikudi Bus-1 and BBP operated tripping all elements connected to the 230kV Karaikudi Bus-1. 230kV Bus-2 and 110kV side was in service during the event.

2. Time and Date of the Event (घटना का समय और दिनांक: 26-03-2026 17:57

3. Event Category (ग्रिड घटना का प्रकार): GI-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)	18705	18717
TamilNadu State Generation (MW)	6303	6248
Grid Frequency (Hz)	49.99	50.09
SR Demand (MW)	58654	58367
SR Generation (MW)	50363	50368

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

Elements under outage	
Weather Condition (मौसम स्थिति)	Normal

At Karaikudi SS:

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 230KV-KARAIKUDI(TN)-KAVANUR-1 2. 230KV-KARAIKUDI(TN)-KAVANUR-4 3. 230KV-KARAIKUDI(TN)-KAVANUR-3 4. 230KV-KARAIKUDI-KARAIKUDI(TN)-1 5. 230KV-KARAIKUDI(TN)-KARAMBAYAM-1 6. KARAIKUDI(TN) - 230KV - Bus 1	1. 230KV-KARAIKUDI-KARAIKUDI(TN)-2 2. 230KV-KARAIKUDI(TN)-KARAMBAYAM-2 3. 230KV-KARAIKUDI(TN)-KAVANUR-2

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): 3 hours, 50 minutes

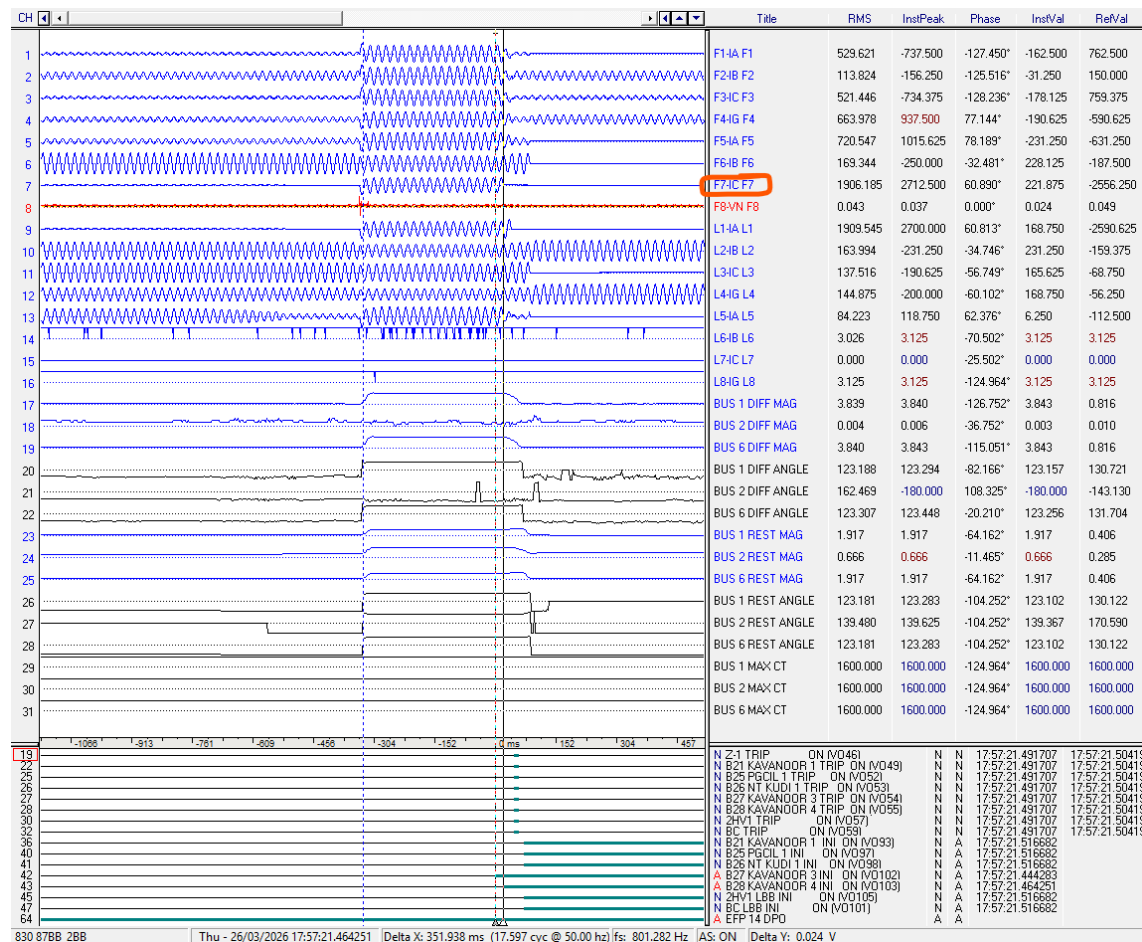
8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA

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

1. 230KV-KARAIKUDI(TN)-KAVANUR-1
2. 230KV-KARAIKUDI(TN)-KAVANUR-3
3. 230KV-KARAIKUDI(TN)-KAVANUR-4
4. 230KV-KARAIKUDI-KARAIKUDI(TN)-1
5. 230KV-KARAIKUDI(TN)-KARAMBAYAM-1
6. KARAIKUDI(TN) - 230KV - Bus 1

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

As per the reports submitted, the triggering incident is the B-ph jumper cut in Bus-1 in 230kV NT Kudy Bay and Kavanur-3 line (as per FIR) which led to the Bus-1 fault. However, from the DR data, it can be observed that the BBP did not operate immediately and operated almost after around 350ms.



It can also be observed that after tripping of F7 (exact line to be confirmed by TANTRANSCO), where in after around 2 cycles BBP operated in Z1 and all the elements connected to Bus-1 tripped. This led to the Tripping of 230kV Bus-1 of Karaikudi SS. 230kV Bus-2 and 110kV side was in service during the event.

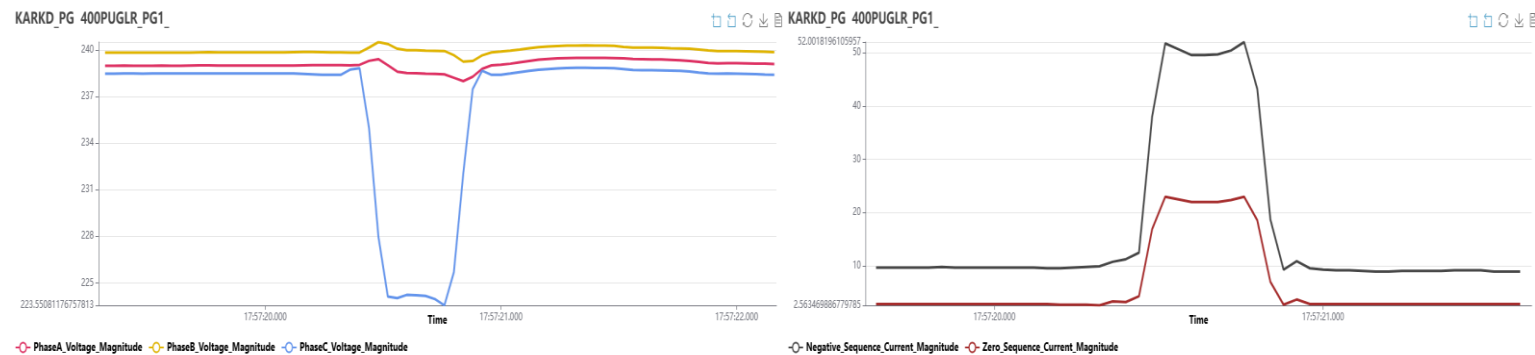
11. DR Analysis:

KARAIKUDI(TN) - 230KV

	KARAIKUDI(TN) - 230KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:26-03-2026 17:57:21.444 DR TRIP ON (VO4), B27 KAVANOOR 3 INI ON (VO102)

B28 KAVANOOR 4 INI ON (VO103)
 B27 CB OPN ON (DI41)
 Z1 BB OP ON (VO5), Z-1 TRIP ON (VO46), B21
 KAVANOOR 1 TRIP ON (VO49), B25 PGCIL 1 TRIP ON
 (VO52), B26 NT KUDI 1 TRIP ON (VO53), B27
 KAVANOOR 3 TRIP ON (VO54), B28 KAVANOOR 4
 TRIP ON (VO55), 2HV1 TRIP ON (VO57), BC TRIP ON
 (VO59)
 B28 CB OPN ON (DI47)
 B21 KAVANOOR 1 INI ON (VO93), B25 PGCIL 1 INI ON
 (VO97), B26 NT KUDI 1 INI ON (VO98), 2HV1 LBB INI
 ON (VO105), BC LBB INI ON (VO101)
 B25 CB OPN ON (DI29), B26 CB OPN ON (DI35)
 B21 CB OPN ON (DI11), 2HV1 CB OPN ON (DI60)
 Ir (max): 0.58 kA Iy (max): 0.12 kA Ib (max): 0.58 kA

12. A) PMU Analysis:



From the PMU analysis, B-G fault can be observed during the event with delayed fault clearance.

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

Constituent	Points for review
TANTRANSCO	1. Delayed operation of BBP protection needs review 2. Non availability of SCADA SOE at KARAIKUDI(TN) needs review

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

Name of element	Restoration date & time
Auto-Tr-1 in Bus-B	18.16/26.03.26
Kavanur-1 in Bus-B	18.59/26.03.26
Kavanur-3 in Bus-B	19.01/26.03.26
PGCIL-1 in Bus-B	21.31/26.03.26
N.T.KUDI-1 in Bus-B	21.39/26.03.26
Kavanur-4 in Bus-A	21.47/26.03.26

After attending B phase JUmper cut in Bus A the above elements were restored to Bus A

230kV Bus Coupler	06.37/27.03.26
Auto-Tr-1 in Bus-A	06.40/27.03.26
Kavanur-1 in Bus-A	06.42/27.03.26
Kavanur-3 in Bus-A	06.49/27.03.26
PGCIL-1 in Bus-A	06.53/27.03.26
N.T.KUDI-1 in Bus-B	06.47/27.03.26

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)	
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	TANTRANSCO

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
26-03-2026 18:07:30	KARAIKUDI CB CAPACITOR CB 11452 OPEN	KKDI2_TN
26-03-2026 18:16:01	KARAIKUDI CB CAPACITOR CB 11452 CLOSED	KKDI2_TN

Detailed Draft Report of grid event submitted by KARAIKUDI(TN) SS:

Detailed Report

Date of Submission : 31-03-2026 13:04

KARAIKUDI(TN) - 230KV tripped at 26-03-2026 17:57 and restored at 26-03-2026 21:47

Summary of Event (घटना का सारांश) : 230kV Bus-A ,B phase jumper cut occurs between N.T.Kudi-1 bay to Kavanur-3 bay ,Bus-A B phase BB operated in Bus-A connected elements only tripped

230kV Bus B & 110kV Bus found stable

Time and Date of the event (घटना का समय और दिनांक) : 26-03-2026 17:57

Name of the Substation/Generating Station/Pooling Station affected (Along with Voltage level) : KARAIKUDI(TN) - 230KV

Event Category (श्रेणी के साथ इवेंट प्रकार) : GI-1

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 230KV-KARAIKUDI(TN)-KAVANUR-1	1. 230KV-KARAIKUDI-KARAIKUDI(TN)-2 2. 230KV-KARAIKUDI(TN)-		

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
2. 230KV-KARAIKUDI(TN)-KAVANUR-4 3. 230KV-KARAIKUDI(TN)-KAVANUR-3 4. 230KV-KARAIKUDI-KARAIKUDI(TN)-1 5. 230KV-KARAIKUDI(TN)-KARAMBAYAM-1 6. KARAIKUDI(TN) - 230KV - Bus 1	KARAMBAYAM-2 3. 230KV-KARAIKUDI(TN)-KAVANUR-2		

Station Connectivity / SLD during antecedent : Double bus with Bus Coupler

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None, None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : 55.0

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment :
Failure (if any during the event):

Equipment Type	Equipment Make
----------------	----------------

List of elements tripped during the event :
1. 230KV-KARAIKUDI(TN)-KAVANUR-1
2. 230KV-KARAIKUDI(TN)-KAVANUR-3
3. 230KV-KARAIKUDI(TN)-KAVANUR-4
4. 230KV-KARAIKUDI-KARAIKUDI(TN)-1
5. 230KV-KARAIKUDI(TN)-KARAMBAYAM-1

Station Connectivity/SLD during the event :

Analysis of the event :
230kV BUS A jumper cut in B phase in between NT kudy bay & Kavanur feeder.3 bay hence bus bar operated in Bus.A and all elements connected in Bus A go tripped

230kV Bus B & 110kV side found stable

Protection / Operational Issues observed : NO

Restoration Details :

Name of element	Restoration date & time
Auto-Tr-1 in Bus-B	18.16/26.03.26
Kavanur-1 in Bus-B	18.59/26.03.26
Kavanur-3 in Bus-B	19.01/26.03.26
PGCIL-1 in Bus-B	21.31/26.03.26

N.T.KUDI-1 in Bus-B	21.39/26.03.26
Kavanur-4 in Bus-A	21.47/26.03.26

After attending B phase Jumper cut in Bus A the above elements were restored to Bus A

230kV Bus Coupler	06.37/27.03.26
Auto-Tr-1 in Bus-A	06.40/27.03.26
Kavanur-1 in Bus-A	06.42/27.03.26
Kavanur-3 in Bus-A	06.49/27.03.26
PGCIL-1 in Bus-A	06.53/27.03.26
N.T.KUDI-1 in Bus-B	06.47/27.03.26

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) :

False

Remedial Measures Taken (सुधारामक सुझाव) :

All elements connected in BUS A transferrerd to Bus B

Relay/PLCC Operation Details :

Control Panel Anunciation : 230kV Bus-A ,Busbar Protection operated

Main I Relay Indications : 87BC: BUS-1 BB Trip,

Main II Relay Indications : nil

Other Relay Indications :

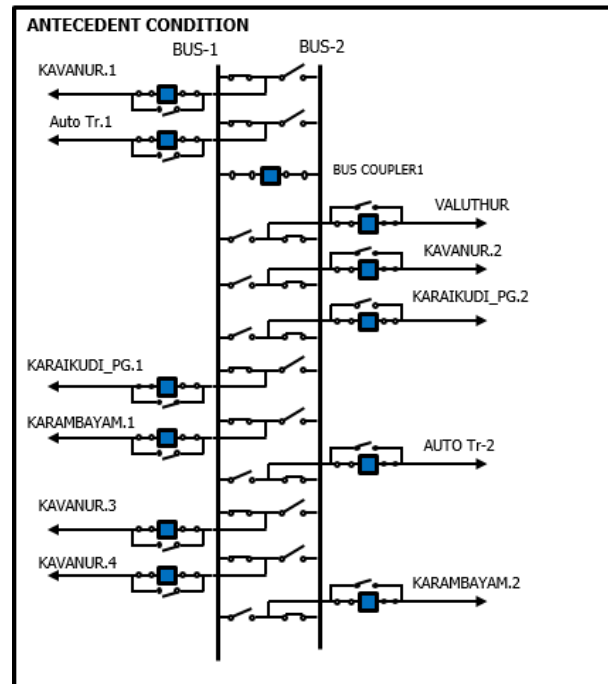
PLCC Counter Increment I/T :

PLCC Counter Increment D/T :

Fault Current Value (kAmp) : 6.0

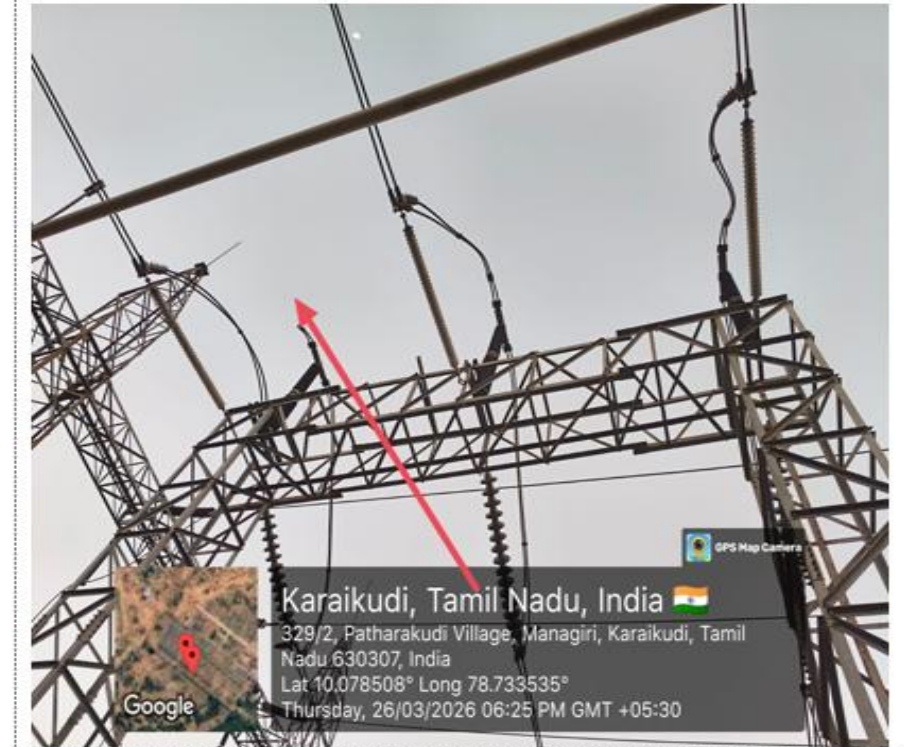
Deliberations:

1. TANTRANSCO stated that in the antecedent conditions, Karaikudi 230kV Substation was operating with a double bus configuration. The 230kV Bus Coupler (L5) was in closed condition.

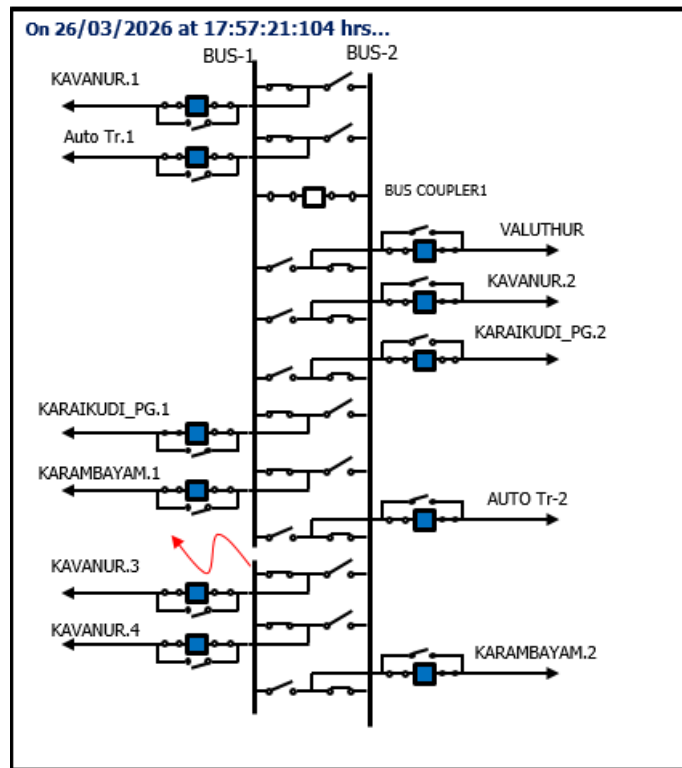


Bus-1 Connected Elements	Bus-2 Connected Elements
Kavanur-1 (F1)	Valuthur (F2)
Auto Transformer-1 (L3)	Kavanur-2 (F3)
Karaikudi PG-1 (F5)	Karaikudi PG-2 (F4)
Karambayam-1 (F6)	Auto Transformer-2 (L4)
Kavanur-3 (F7)	Karambayam-2
Kavanur-4 (L1)	

2. TANTRANSCO stated that the fault was in between Kavanur-3(L1) & Karambayam Line-1 (F6). From the DR following were inferred:
 - a. No current was observed in Kavanur-3 & Kavanur-4 feeder (17:57:20:942 to 17:57:21:102 hrs).
 - b. Jumper towards Kavanur-3 had opened & not earthed for 160 msec.



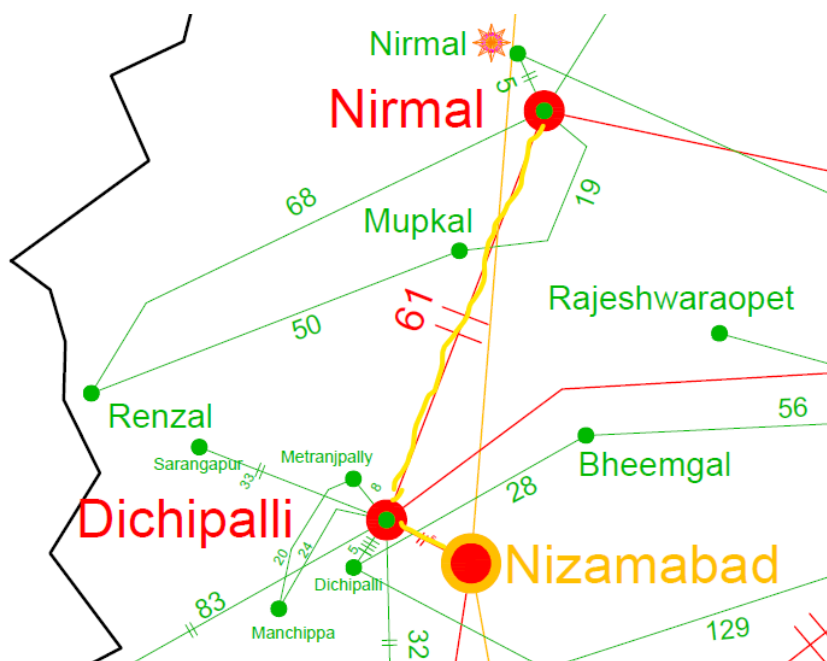
3. TANTRANSCO informed that fault current raised from 17:57:21:104 hrs in Kavanur-3 & Kavanur-4 only, rest of the bays connected in Bus-1 was having normal load current since Jumper had earthed towards Kavanur 3 & kavanur 4 direction. During the incident, all the elements connected in Bus-1 currents were not converged due to nature of fault.



4. Fault current raised from **17:57:21:465 hrs** in Kavanur-3 & 4 feeder tripped on reverse zone. The Busbar protection did not operate for 350 ms, due to the blocking of directional feature in the Busbar relay even though the Differential and Restraining current were 3.85kA and 1.85kA respectively.
5. The Busbar relay had initiated trip only during decay of current in Kavanur-4 feeder at **17:57:21:494**. From the analysis it was concluded that, as per the Relay principle the protection operated in order, since the nature of fault was such that, Bus-1 itself had sectionalized during the fault. This was addressed to OEM for further analyzing.
6. **GE B90 Relay logic (extract from relay manual):** The directional principle is an integral part of the biased bus differential element and has no associated settings. The directional element dynamically identifies what appear to be the faulted circuit and compares its angle with that of the sum of the remaining currents of the protected zone. The element declares bus fault, if the angle is less than 90.
7. SRLDC highlighted that BUSBAR should operate instantaneously, but due to directionality logic there is a delay and requested forum's opinion. PGCIL SR-II stated that this logic is inbuilt in the relay and when there is directionality issue there would be delay.

S. No	Event	Event Analysis	Outage Date & time	Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Date of receipt of Draft Report/ Updated draft report from SRLDC	Date of receipt of User Detailed report	SRLDC furnished revised Report after considering the User Report
6	Tripping of 400kV Bus-2 at Dichipally of TGTRANSCO	The triggering incident is the R-G Bus fault in 400 kV Bus-2 due to bus post insulator failure leading to Bus Bar protection Operation and leading to the tripping of 400kV Bus-2 at Dichipally due to inclement weather conditions. 400 kV Dichipally-Nirmal line and 400 kV/220 kV Dichipally ICT-4 got tripped during the event.	04-04-2026 22:26	0	0	GI-2	23-04-2026	20-04-2026	Considered

SLD of the affected Sub-station/Connectivity Diagram:



Detailed Draft Report of grid event submitted by SRLDC:

1. Event Summary (घटना का सारांश):

The triggering incident is the R-G Bus fault in 400 kV Bus-2 due to bus post insulator failure leading to Bus Bar protection Operation and leading to the tripping of 400kV Bus-2 at Dichipally due to inclement weather conditions. 400 kV Dichipally-Nirmal line and 400 kV/220 kV Dichipally ICT-4 got tripped during the event.

2. Time and Date of the Event (घटना का समय और दिनांक: 04-04-2026 22:26

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)	9867	9864
Telangana State Generation (MW)	5569	5550
Grid Frequency (Hz)	50.09	50.08
SR Demand (MW)	56826	56628
SR Generation (MW)	48716	48469

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

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

Bus configuration at Dichipally :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements
1. 400KV-DICHPALLY-NIRMAL-1 2. 400KV-DICHPALLY-NIRMAL-2 3. 400KV-DICHPALLY-NIZAMABAD-1 4. 400KV-DICHPALLY-NIZAMABAD-2 5. 400KV-DICHPALLY-RAMAGUNDAM-1	1. 400KV/220KV DICHPALLY-ICT-1 2. 400KV/220KV DICHPALLY-ICT-2 3. 400KV/220KV DICHPALLY-ICT-3 4. 400KV/220KV DICHPALLY-ICT-4

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): 20 hours, 0 minutes

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

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

1. 400KV-DICHPALLY-NIRMAL-1
2. 400KV/220KV DICHPALLY-ICT-4
3. DICHPALLY - 400KV - Bus 2

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

Due to inclement weather multiple faults can be observed from the PMU.

Event at 22:30:56 Hrs:

As per the reports submitted, the first fault which was triggered in 400kV Dichpally-Nirmal line was B-G fault within the substation and subsequent Y-G fault during the AR dead time due to isolator damage. At Nirmal end the first B-G fault was sensed in Zone 1 and B pole opened and during the subsequent Y-G fault was sensed in Z2 carrier aided protection and Y-pole opened, but the R-pole was in service until it tripped on suspected PD operation after around 3.1s from the initial fault (as per EL). At Dichipally end the first B-G fault was sensed in Zone 1 and B pole opened and during the subsequent Y-G fault was sensed in Z1 and 3 ph tripped.

Event at 22:31:08 Hrs:

The triggering incident is the R-G fault within the ICT differential zone due to failure of Bus post insulator and differential protection operated leading to the tripping of 400/220kV Dichipally ICT-4

Event at 22:31:16 Hrs:

The triggering incident is the R-G fault in 400kV Bus-2 due to failure of Bus post insulator and Bus Bar protection operated and all the main breakers connected to Bus-2 tripped and led to the tripping of 400kV Bus-2 at Dichipally. 400kV Bus-1 was in service during the event and all other elements were in service through tie breakers due to one and half breaker scheme.

The sequence of tripping is as shown below:

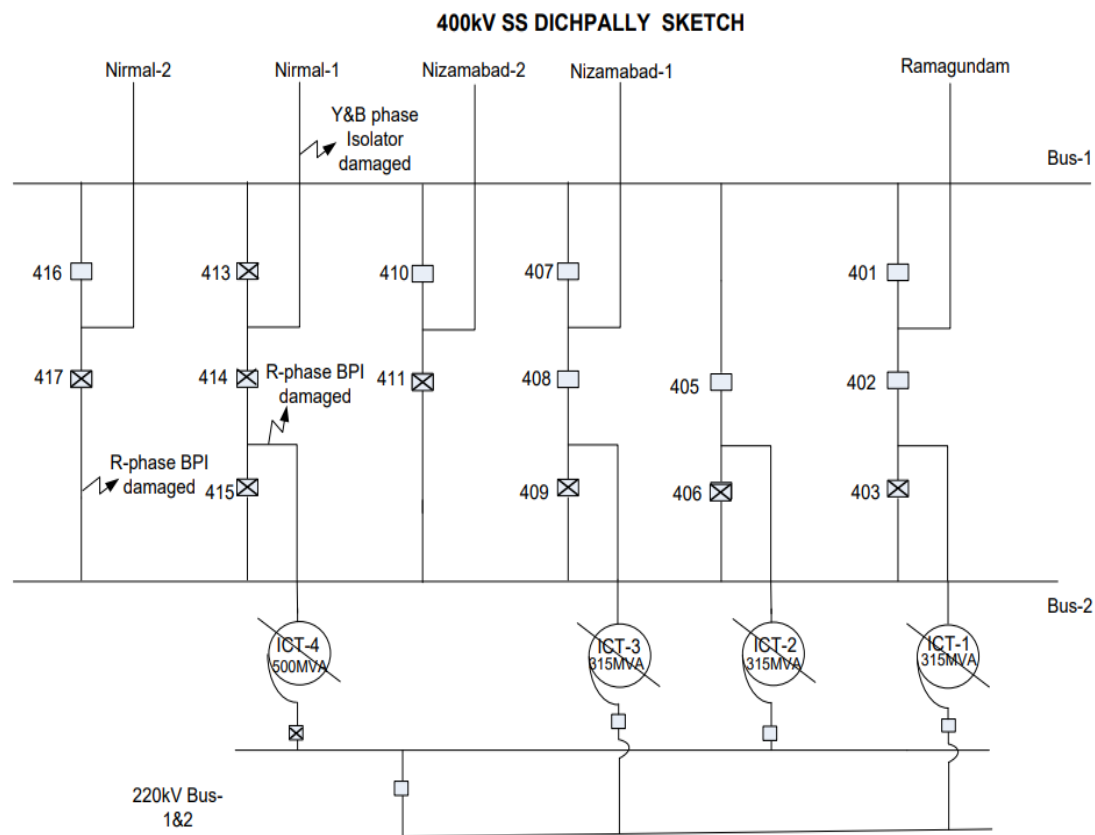
Element Name with fault

1. B-G fault in Dichpally-Nirmal Line
2. Y-G fault in Dichpally-Nirmal Line
3. R-G fault in Dichpally ICT-4
4. R-G fault in Dichpally Bus-2

Time of Trip

1. 04/04/2026 22:30:56:880
2. 04/04/2026 22:30:57:560
3. 04/04/2026 22:31:08:720
4. 04/04/2026 22:31:16:520

The location of fault with the SLD is as shown below:



The faults within the substation



Fault in 400kV Nirmal-Dichipally-1



Fault in 400/220kV ICT-4 at Dichipally



Fault in 400kV Bus-2

11. DR Analysis:

400KV-DICHPALLY-NIRMAL-1

	DICHPALLY - 400KV	NIRMAL - 400KV
Time Sync Issue	Yes	Yes
DR Analysis	DR Trigger Time:04-04-2026 22:28:23.454 1pole open L3 Relay PICKUP, Relay PICKUP L1 Dis.Pickup L2, Dis.Pickup E, Dis. forward, Relay PICKUP L2, Relay PICKUP E, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3 Relay TRIP 86B OPTD >Trig.Wave.Cap. Ir (max): 0.65 kA Iy (max): 28.23	DR Trigger Time:04-04-2026 22:30:32.838 OSC TRIGGER ON (VO64), GND DIST Z1 OP, PUTT TX1 L12 T B CLS OFF (CI12) L19 M B CLS OFF (CI19) PH DIR1 BLK PUTT OP, L6 CR RX-1/2 ON (CI6) L18 M Y CLS OFF (CI18) L11 T Y CLS OFF (CI11) L1 GR-B OPTD ON (CI1)

	kA Ib (max): 0.03 kA Vr (max): 279.64 kV Vy (max): 241.18 kV Vb (max): 69.21 kV	L17 M R CLS OFF (CI17) Ir (max): 0.64 kA Iy (max): 7.25 kA Ib (max): 8.05 kA Vr (max): 241.56 kV Vy (max): 242.55 kV Vb (max): 241.30 kV
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400KV/220KV DICHPALLY-ICT-4

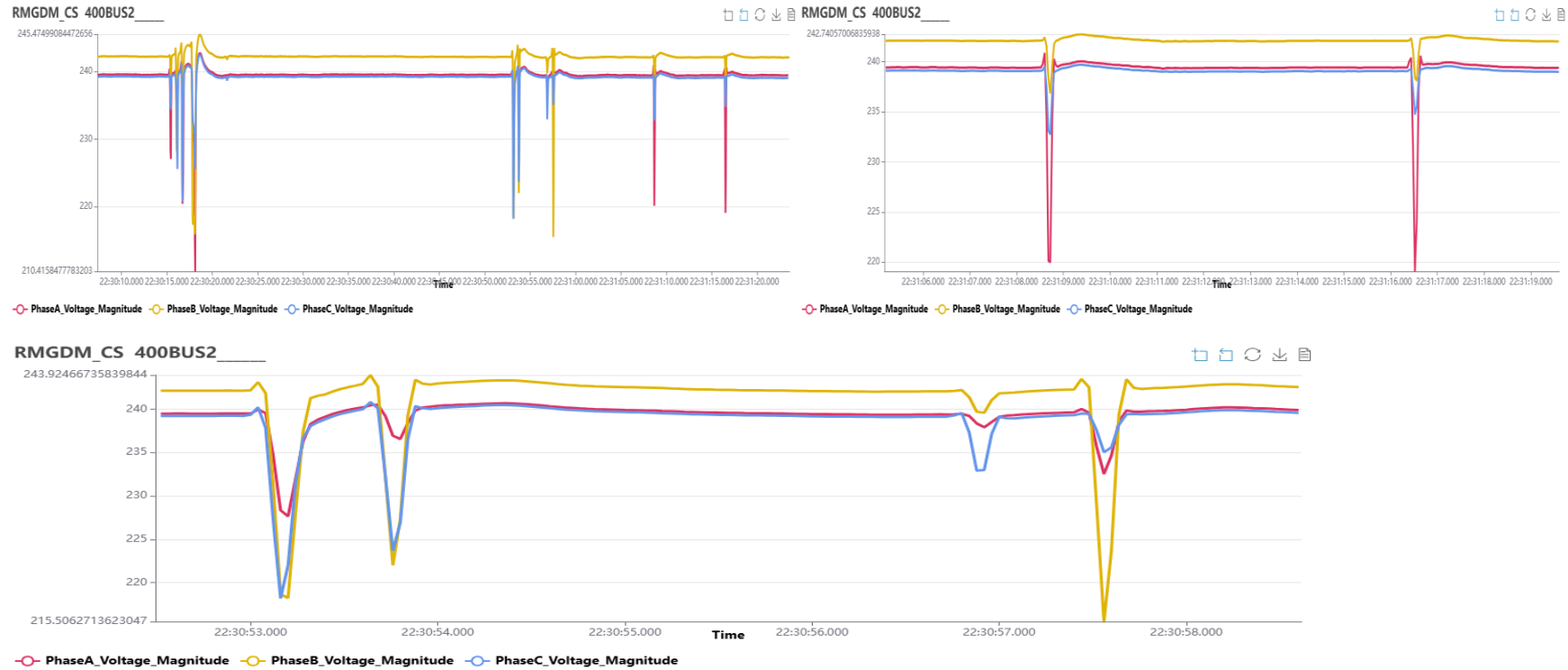
	DICHPALLY - 400KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:04-04-2026 22:29:54.451 Idiff Trip A L11 IV GRP A TR L10 IV GRP B TR L8 GRP A TRIP L9 GRP B TRIP L9 GRP B TRIP L9 GRP B TRIP Ir (max): 26.57 kA Iy (max): 0.75 kA Ib (max): 0.94 kA

DICHPALLY - 400KV

	DICHPALLY - 400KV
Time Sync Issue	Yes
DR Analysis	DR Trigger Time:04-04-2026 21:32:34.621 Any Trip, 87BB Fault Ph A, Trip 87BB Trip Zone 2 Ext. 3 ph Trip, BB TRP RLY OPTD CB Aux. 3ph(52b) Ir (max): 22.54 kA Iy (max): 0.27 kA Ib (max): 0.41 kA DR Trigger Time:04-04-2026 21:32:34.621 Fault Check Zone

Fault Phase A, Flt 87BB Zone 2, Trip 87BB Zone 2
Ir (max): 27.51 kA Iy (max): 0.11 kA Ib (max): 0.05 kA

12. A) PMU Analysis:



From the PMU data multiple faults can be observed during the event and prior to the event

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

Constituent	Points for review
TGTRANSCO	<ol style="list-style-type: none"> 400KV-DICHPALLY-NIRMAL-1 non opening of R-ph pole after Y-ph fault in dead time at NIRMAL end needs review. Sensing of Fault in the substation at DICHPALLY as Z1 for 400KV-DICHPALLY-NIRMAL-1 at NIRMAL end needs review.

	3. Different Fault distance for 400KV-DICHPALLY-NIRMAL-1 at NIRMAL in M1(61km sensed in Z2) and M2 (39km sensed in Z1) needs review
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14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

Constituent	Remedial Actions
TGTRANSCO	<p>a) Restored the Bus - 2 and ICT - 4 by replacing the damaged Bus Post Insulator (BPIs) with spare BPIs at 18:26Hrs on 05-04-2026.</p> <p>b) Replaced the damaged Line Isolator with spare and charged the 400kV Dichpally – Nirmal – 1 feeder.</p> <p>c) New GPS server was drawn from the stores for replacement of the damaged GPS server and commissioning of the same will be done in 3-4 weeks.</p> <p>d) Non operation of Auto recloser on 400kV Dichpally – Nirmal – 1 feeder will be studied.</p>

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

16. Restoration Details:

05/04/2026 18:26

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	TGTRANSCO

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

Annexure 1

Sequence of Events as per SCADA

time	Event	Location
04-04-2026 22:31:21	DICHPALLY 220 CB 20252 (LINE-2 TO DCPL4) OPEN	DCPL2_AT
04-04-2026 22:31:21	DICHPALLY 220 CB 20152 (LINE-1 TO DCPL4) OPEN	DCPL2_AT
04-04-2026 22:31:44	NIRMAL 400KV CB TIE 11 - CB 41152 OPEN	NRML4_AT
04-04-2026 22:31:44	NIRMAL 400KV CB TIE 10 - CB 41052 OPEN	NRML4_AT

Detailed Draft Report of grid event submitted by DICHPALLY SS:

Detailed Report

Date of Submission : 20-04-2026 16:16

DICHPALLY - 400KV tripped at 04-04-2026 22:26 and restored at 05-04-2026 18:26

Summary of Event (घटना का सारांश) : On 04-04-2026 at 22:26Hrs, Grid Incident occurred at 400/220kV Dichpally Substation due to severe gale and storm conditions resulting in multiple 400kV& 220kV element trippings along with equipment damages and the details are as follows.

i) 400kV Busbar Zone-2 protection operated and tripped all the breakers connected to Bus-2 due to damage of R-Phase Bus Post Insulator (BPI) connecting the Nirmal-2 TIE CB(417) to Bus-2.

ii) 500MVA ICT-IV tripped on Differential and HV overcurrent highest protection due to damage of ICT-IV HV R-Phase Bus Post Insulator (BPI).

iii) 400kV Dichpally – Nirmal -1 feeder tripped on B-phase to ground fault due to damage of Y & B phase line Isolator.

During the tripping incident the following discrepancies observed

1) No GPS Time Synchronization.

2) On 400kV Dichpally - Nirmal-1 feeder, even though there was Y-phase to ground fault Main-2 Siemens 7SA522 relay has given 3-phase tripping.

Time and Date of the event : 04-04-2026 22:26
(घटना का समय और दिनांक)

Name of the Substation/Generating Station/Pooling Station : DICHPALLY - 400KV

affected (Along with Voltage level) :

Event Category (श्रेणी के साथ इवेंट प्रकार) : GI-2

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

Configuration of Bus (HV/LV) . Along with details of Bus split Operation (if any) :

Bus Configuration Type : One and half breaker

Bus Coupler Status : NA

Bus 1 Connected Elements	Bus 2 Connected Elements	Bus 3 Connected Elements	Bus 4 Connected Elements
1. 400KV-DICHPALLY-NIRMAL-1 2. 400KV-DICHPALLY-NIRMAL-2 3. 400KV-DICHPALLY-NIZAMABAD-1 4. 400KV-DICHPALLY-NIZAMABAD-2 5. 400KV-DICHPALLY-RAMAGUNDAM-1	1. 400KV/220KV DICHPALLY-ICT-1 2. 400KV/220KV DICHPALLY-ICT-2 3. 400KV/220KV DICHPALLY-ICT-3 4. 400KV/220KV DICHPALLY-ICT-4		

Station Connectivity / SLD during antecedent : enclosed

Weather Conditions : Thunders, Windy

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) :

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping : Fault Tripping

Type of Fault : SLG

phases inv : None, None

Auto Reclosure Operation : No

Fault Clearing Time (ms) : None

Load and Generation Loss :
(लोड और जेनरेशन हानि)

Total Generation Loss (MW)	Total Load Loss(MW)
0 MW	0 MW

Duration of interruption :
(रूकावट की अवधि)

Details of Equipment Failure (if any during the event): :

Equipment Type	Equipment Make
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List of elements tripped during the event : 1. 400KV/220KV DICHALLY-ICT-4
2. 400KV-DICHALLY-NIRMAL-1
3. DICHALLY - 400KV - Bus 2

Station Connectivity/SLD during the event : Enclosed

Analysis of the event : On 04-04-2026 at 22:26Hrs, Grid Incident occurred at 400/220kV Dichpally Substation due to severe gale and storm conditions resulting in multiple 400kV& 220kV element trippings along with equipment damages and the details are as follows.

i) 400kV Busbar Zone-2 protection operated and tripped all the breakers connected to Bus-2 due to damage of R-Phase Bus Post Insulator (BPI) connecting the Nirmal-2 TIE CB(417) to Bus-2.

ii) 500MVA ICT-IV tripped on Differential and HV overcurrent highest protection due to damage of ICT-IV HV R-Phase Bus Post Insulator (BPI).

iii) 400kV Dichpally – Nirmal -1 feeder tripped on B-phase to ground fault due to damage of Y & B phase line Isolator.

During the tripping incident the following discrepancies observed

1) No GPS Time Synchronization.

2) On 400kV Dichpally - Nirmal-1 feeder, even though there was Y-phase to ground fault Main-2 Siemens 7SA522 relay has given 3-phase tripping.

Protection / Operational Issues observed :

Restoration Details :

Sl. No.	Voltage Level (kV)	Name of the Element	Date of Restoration (DD-MM-YYYY)	Time of Restoration (Hrs)
1	400kV	Bus-2	05-04-2026	18:26
2	400kV	500MVA ICT-4	05-04-2026	18:26
3	400kV	Dichpally – Nirmal - 1	06-04-2026	19:28

DR Time synchronization issues observed (सुरक्षा/प्रचालन समस्या) : True

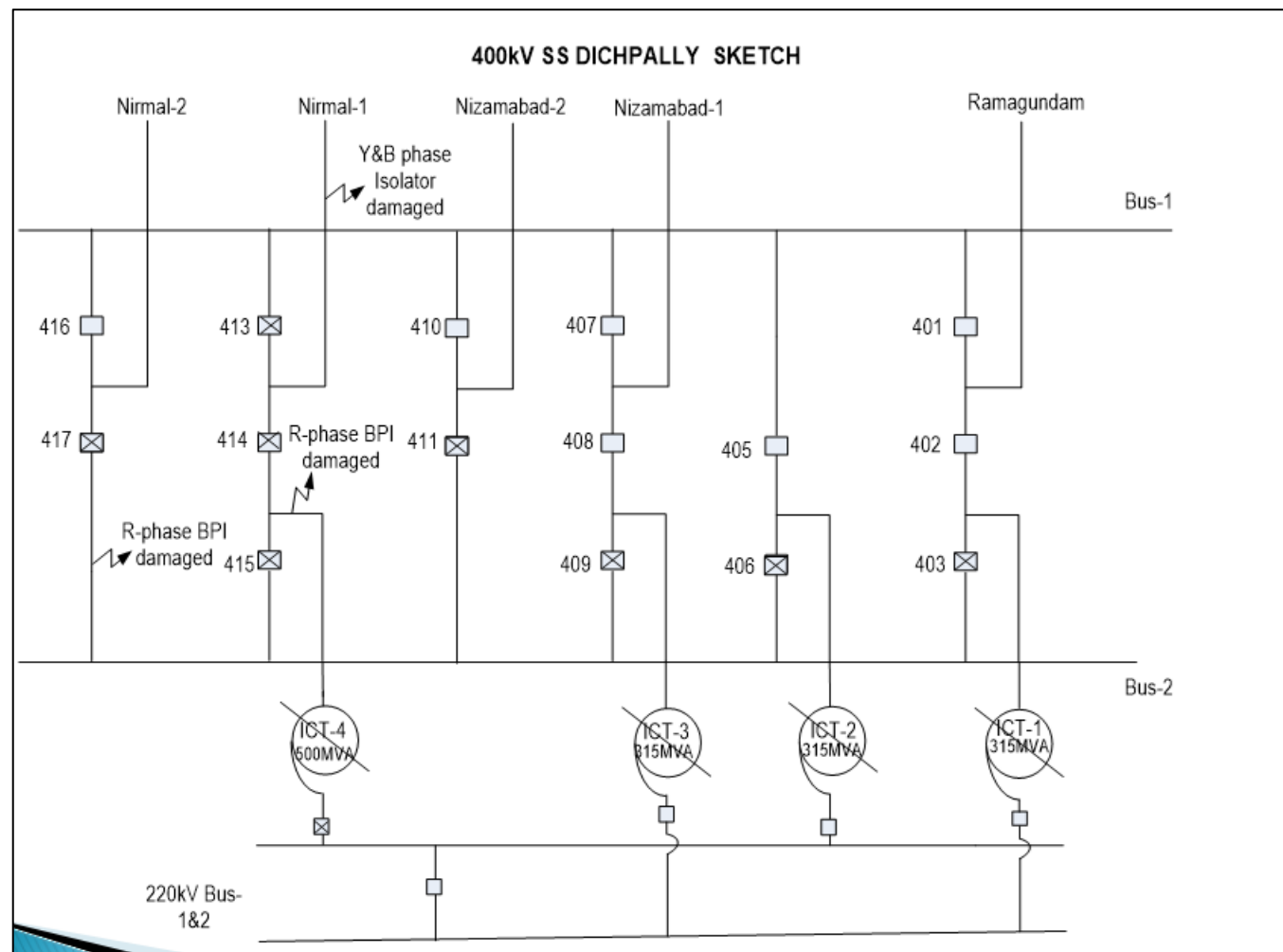
Remedial Measures Taken (सुधारात्मक सुझाव) : a) Restored the Bus - 2 and ICT - 4 by replacing the damaged Bus Post Insulator (BPIs) with spare BPIs at 18:26Hrs on 05-04-2026.

- b) Replaced the damaged Line Isolator with spare and charged the 400kV Dichpally – Nirmal – 1 feeder.
- c) New GPS server was drawn from the stores for replacement of the damaged GPS server and commissioning of the same will be done in 3-4 weeks.
- d) Non operation of Auto recloser on 400kV Dichpally – Nirmal – 1 feeder will be studied.

Relay/PLCC Operation Details	:	
Control Panel Anunciation	:	Busbar protection Operated
Main I Relay Indications	:	87BB Zone-2 operated
Main II Relay Indications	:	NIL
Other Relay Indications	:	
PLCC Counter Increment I/T	:	
PLCC Counter Increment D/T	:	
Fault Current Value (kAmp)	:	26.0
LA Counter	:	
Remarks	:	
Attachments	:	<ol style="list-style-type: none"> 1. SLD/Connectivity Diagram 2. Others 3. Others 4. Others

Deliberations:

1. TGTRANSCO stated that on 04.04.2026 at 22:26 hrs, a grid incident had occurred at 400/220 kV Dichpally substation due to severe gale and storm, resulting in tripping of multiple 400 kV and 220 kV elements along with equipment damage.



2. TGTRANSCO informed that 400 kV Busbar Zone-2 protection operated and tripped all breakers connected to Bus-2, due to damage of R-phase Bus Post Insulator (BPI) connecting Nirmal-2 Tie Circuit Breaker-417 to Bus-2. It was further informed that 500 MVA ICT-IV tripped on Differential Protection and HV Overcurrent Highest Protection, due to damage of ICT-IV HV side R-phase Bus Post Insulator. Further, 400 kV Dichpally–Nirmal-1 feeder had tripped on B-phase to ground fault, due to damage of Y and B phase line isolators. TGTRANSCO also informed that GPS time synchronisation was not available during the incident.



3. Remedial Actions taken:

- Restored the Bus - 2 and ICT - 4 by replacing the damaged Bus Post Insulator (BPIs) with spare BPIs.
- Replaced the damaged Line Isolator with spare and charged the 400kV Dichpally – Nirmal – 1 feeder.

- New GPS server was commissioned on 16-04-2026 and all feeders'/ICTs' relays time Synchronization done, except Main-2 Siemens relays on 400kV Dichpally-Nirmal-1 & 2 feeders
4. SRPC highlighted that multiple elements had failed simultaneously during the event and requested TGTRANSCO to carry out detailed investigation into the incident. TGTRANSCO stated that this was the first instance of such multiple failures observed at the substation.
 5. SRPC highlighted that at Nirmal end, the fault had been sensed under Zone-1 protection, indicating possible overreach condition and requested TGTRANSCO to review the protection settings at Nirmal end.
 6. SRLDC highlighted that at Nirmal end, initially B-pole had opened and during the subsequent fault within reclaim time, three-phase tripping had not occurred. TGTRANSCO stated that the matter had already been referred to field personnel for necessary rectification.
 7. TGREANSCO advised to review the DR time synchronization 400kV Dichpally& 400kV Nirmal

Recommendations:

 ***TGTRANSCO to review the distance protection settings at Nirmal end.***
