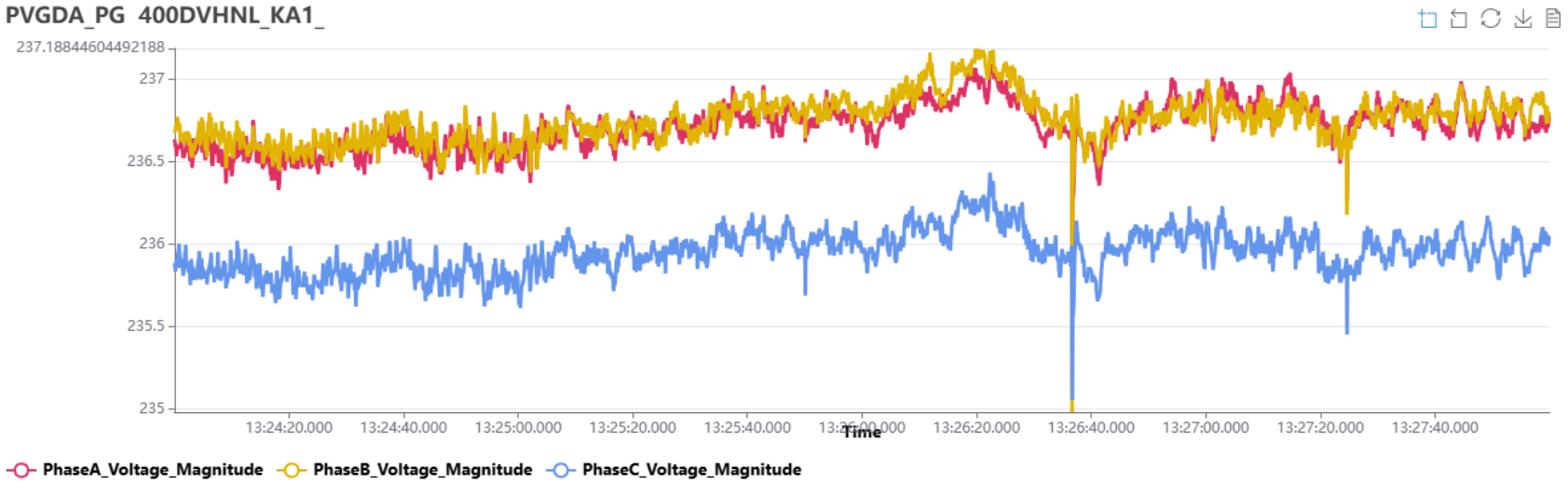
Grid Occurrences – 147

III. Single/Multiple Element Tripping with Protection Violation

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
1	220KV-PAVAGADA_PG-IRCON_PVG_S-2	As per the reports submitted, the triggering incident was the zero value of R phase CT current at IRCON Pavagada end. This triggered the line differential protection of the 220kV-Pavagada_PG-IRCON_PVG_S-2 line at IRCON end and line R phase tripped at IRCON end only.	01-08-2026 13:26	**PVG_IRCONS**: 1. CT issue at Pavagada IRCON end needs review.	

	PAVAGADA_PG	**IRCON_PVG_S**
FIR	Line Holding	Observed R Phase current is showing Zero Value
DR	NA	GEN_DIFF TRIP DIFF TRIP_L1 DIFF REMOTE TRIP CARR SEND MAIN_TRIP TRIP_L1
EL	NA	Same as DR
TR	Same as FIR	Same as FIR

PMU Analysis:



From the PMU plot no fault was observed.

Deliberations:

No representation by the Pavagada IRCON

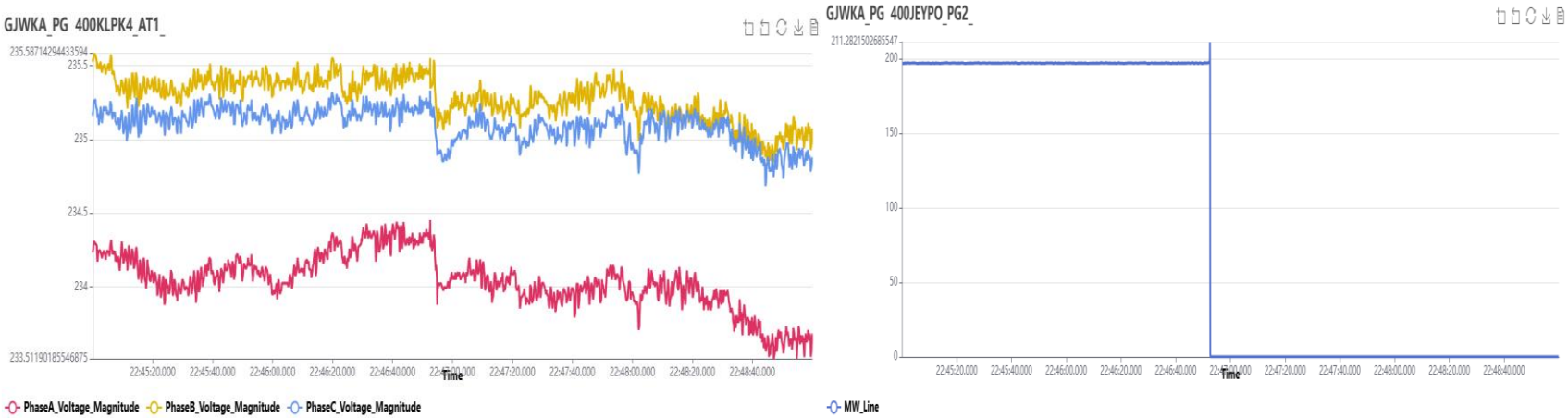
Recommendations:

- Pavagada IRCON to submit the detailed report on the incident.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
2	400KV-GAZUWAKA-JEYPORE-2	As per the reports submitted, 400 kV-Gazuwaka-Jeypore-2 line tripped at Gazuwaka end due to TEED relay hanging issue.	23-08-2026 22:47	**PGCIL SR-1** : 1. Maloperation of TEED relay leading to the tripping of the line needs review	

	GAZUWAKA	**JEYPORE**
FIR	Tripped on operation of TEED protection	NA
DR	DR Trigger Time:23-08-2026 22:46:52.098 GRA/B_OPD M CB_RO M CB_YO T CB_YO M CB_BO T CB_RO T CB_BO	NA
EL	CB R_Y_B PHASE open Main -2 I/2 protection - Trip	NA
TR	Same as FIR	NA

PMU Analysis:



From the PMU plot, no fault was observed

Deliberations:

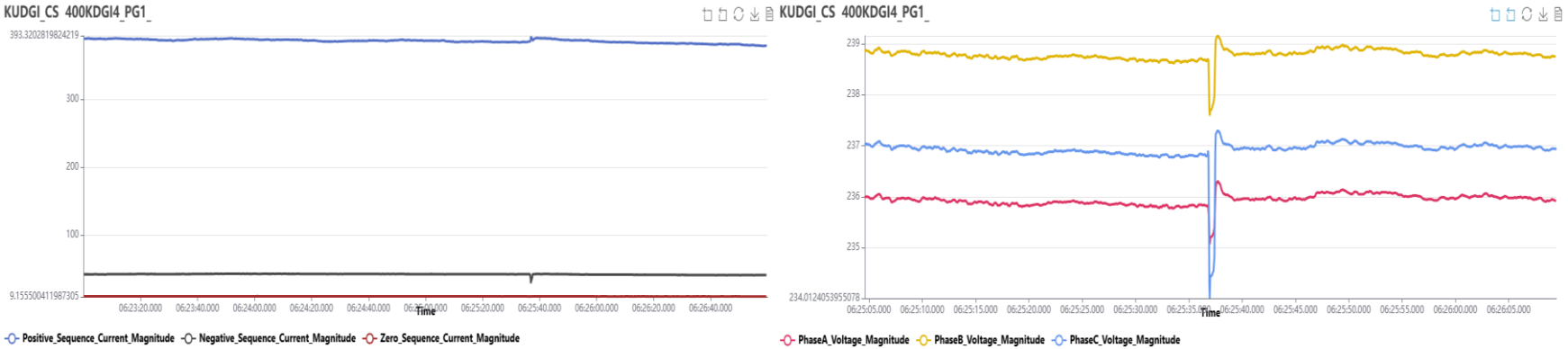
1. PGCIL SR-I informed that 400 kV Gajuwaka–Jeypore Line-2 tripped at the Gajuwaka end due to operation of the TEED protection. Gajuwaka East Bus is connected to Jeypore through two 400 kV lines and TEED protection has been provided involving four CT inputs, comprising two bay CTs, line CT and reactor CT.
2. PGCIL SR-I informed that analysis of the DRs indicated normal currents in the reactor backup impedance protection as well as in the Line Main-1 and Main-2 protections, indicating absence of any primary system fault.
3. During further investigation, it was observed that the TEED-2 relay (7UT85) had hanged and was continuously issuing a trip command, resulting in tripping of the line at the Gajuwaka end.
4. PGCIL SR-I informed that the defective TEED-2 relay was replaced with a healthy spare relay and the line was restored at 00:23 hrs on 24.08.2026.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
3	220KV-KUDGI_NTPC-BILAGI-1	As per the reports submitted, the triggering incident was the tripping of the 220 kV Bilagi–Kudgi Line-1 on non-directional OCR, with 86A and 86B relays operating at Bilagi end. The suspected cause was an issue with the line CVT selector switch with a VT fuse failure. At the Kudgi end, the line was in service.	24-08-2026 06:25	**KPTCL**: 1. Tripping of the line on non-directional overcurrent protection needs review 2. VT fuse failure during the event needs review	

	KUDGI_NTPC	BILAGI
FIR	On 24.08.2026 at 06:25 hrs, 220 kV KUDGI NTPC - Bilagi-1 transmission line tripped from Bilagi end. However, no DT signal was received at NTPC Kudgi end, and no disturbance, fault indication, or protection operation was observed at the NTPC Kudgi end during the event. The line remained healthy from NTPC Kudgi side, and the reason for non-receipt of DT signal may be investigated with the concerned transmission utility.	220kV Bilagi-Kudagi Line-1 tripped on Non directional OCR with 86A and 86B Relays
DR	NA	DR Trigger Time:24-08-2026 06:25:36.658 O/C PICKUP Ip O/C TRIP Ip, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3 AR in progress, AR R INI, AR B INI AR Y INI

EL	NA	**220kV Bilagi-Kudagi Line-1 Tripped** 220kV Bilagi-Kudagi Line-1 Tripped on Non directional OCR with 86A and 86B Relays (Suspected Line CVT Selector switch problem with VT Fuse fail). **Line Charged** 220kV Bilagi-Kudagi Line-1 Charged in co-ordination with TLM and RT Staff. The line remains stand after first test charge.
TR	Same as FIR	Same as FIR

PMU Analysis:



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

Deliberations:

1. KPTCL informed that 220 kV Bilagi–Kudgi Line-1 tripped only at the Bilagi end on operation of Non-Directional Over Current protection, along with operation of 86A and 86B trip relays. The line remained in service at the Kudgi end.
2. KPTCL informed that Bilagi 220 kV Substation was commissioned on 09.05.2026 by LILO of 220 kV Savalagi–Kudgi Line-2 and subsequently 220 kV Savalagi–Kudgi Line-1 was also LILOed at Bilagi on 04.07.2026.

3. KPTCL further informed that due to a problem in the voltage selector switch of Kudgi Line-1 CRP at the Bilagi end, voltage was not extended to the Main-2 relay and VT Fuse Fail condition was persisting in the relay.
4. Consequently, the Non-Directional Over Current element in Main-2 remained active under the VT Fuse Fail condition and operated for faults occurring on other lines, resulting in unwarranted tripping of 220 kV Bilagi–Kudgi Line-1. Similar spurious trippings were observed during faults on Bilagi–Kudgi Line-2 on 27.08.2026 and 31.08.2026.
5. KPTCL informed that the issue with the voltage selector switch was rectified on 01.09.2026 and no further spurious trippings have been observed thereafter.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
4	Multiple trippings at 400kV Salem_TN	As per the reports submitted, prior to the tripping ICT-4 was in service through Tie CB and it was not connected with Main CB due to maintenance work. During charging of main CB with ICT-4, it got tripped due to REF protection. ICT-5 tripped Winding Temp Trip Protection after overloading due to tripping of ICT-4 in Salem Substation.	24-08-2026 17:20	**TANTRANSCO** : 1. Tripping of the transformer on REF protection needs review.	**TANTRANSCO** : 1. REF trip kept discontinued in Tpro relay & rewired and enabled in GE_T60 relay & functional test conducted. Alarm enabled & under observation

400KV/110KV SALEM_TN-ICT-4

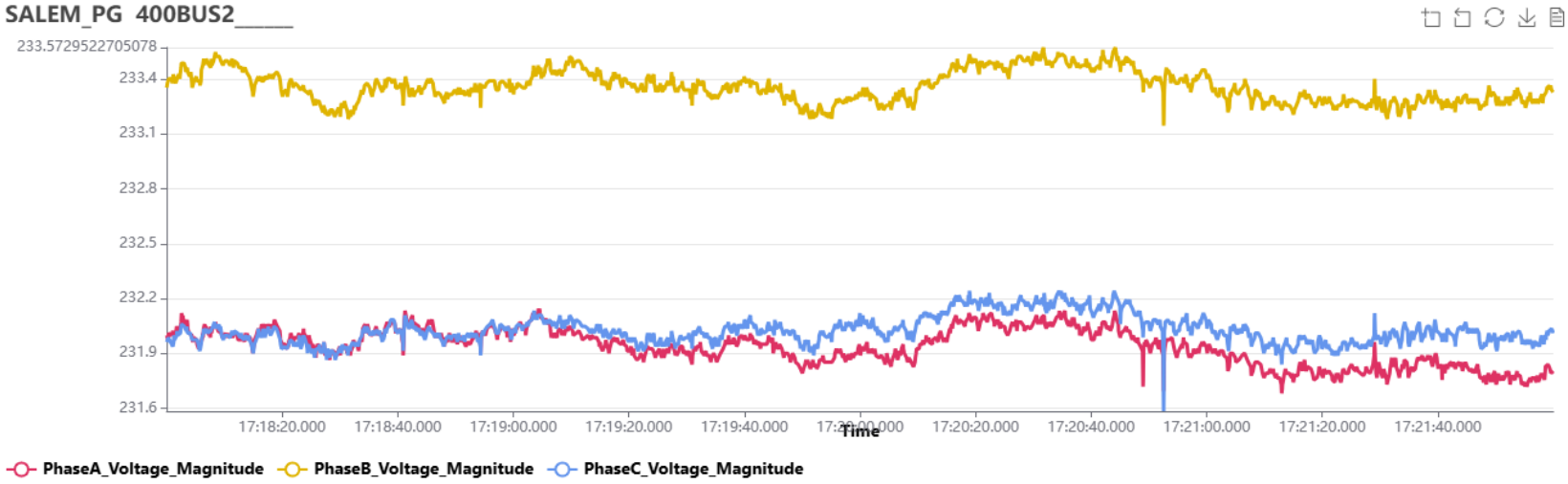
	SALEM_TN-ICT-4
FIR	During the antecedent condition,ICT.4 was in service through Tie breaker. Main breaker was under line clear for Bus.2 maintenance work While charging the main breaker, Tpro relay issued REF trip.
DR	DR Trigger Time:24-08-2026 17:21:28.989 87 Restraint, 87N-HV High Mismatch 87N-HV Trip REF Trip, DO-3 : TRIP ANNUN, DO-6 : GROUP-B TRIP, DO-8 : DR TRIG To M1, DO-28 : REF TEST

	DI_8_DR TRIG M1 87 Restraint
EL	Same as DR
TR	Same as FIR

400KV/110KV SALEM_TN-ICT-5

	SALEM_TN-ICT-5
FIR	After tripping of ICT4, ICT 5 got overloaded & tripped on Wdg Temp High trip
DR	-
EL	Same as DR
TR	Same as FIR

PMU Analysis:



From the PMU data, no fault was observed.

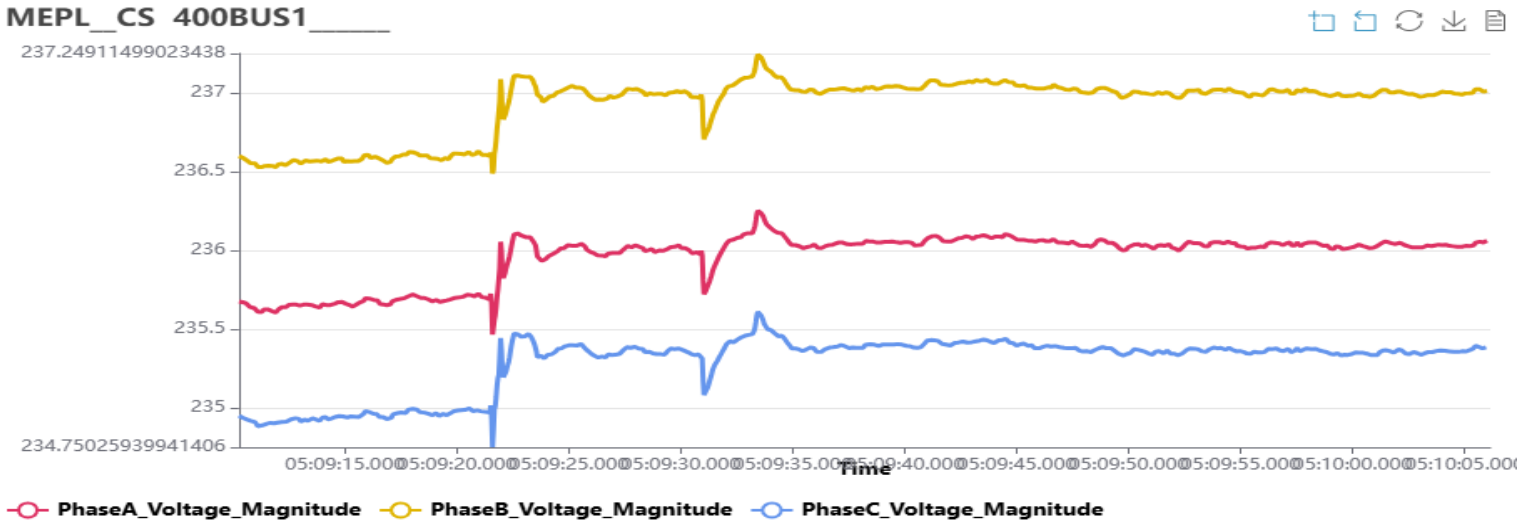
Deliberations:

1. TANTRANSCO informed that 400 kV Bus-2 at Salem SS was under LC from 09:30 hrs on 24.08.2026 and, accordingly, the Main CB of ICT-4 was kept open. ICT-4 remained in service through the Tie CB and ICT-3 Main CB.
2. TANTRANSCO informed that after completion of the maintenance work, while closing the Main CB of ICT-4 at around 17:20 hrs, the Main-2 ERL T-Pro relay issued an REF trip, resulting in tripping of ICT-4. Main-1 GE T60 relay and differential protection remained stable.
3. TANTRANSCO further informed that no abnormality was observed in the 400 kV and 110 kV Busbar Protection DRs. The IR values of the bushing CT secondary circuits were checked and found normal. Secondary injection tests for differential and REF functions of the ERL T-Pro relay were also carried out and the relay was found healthy.
4. TANTRANSCO informed that the REF operation of the Main-2 T-Pro relay during closing of the Main CB was considered spurious. As a precautionary measure, REF protection was rewired and configured in the Main-1 GE T60 relay. ICT-4 was normalised at 01:31 hrs on 25.08.2026 after testing of both Main-1 and Main-2 protections.
5. TANTRANSCO further informed that following tripping of ICT-4, the only parallel transformer, ICT-5, became overloaded and subsequently tripped at 17:35 hrs on operation of IV Winding Temperature High protection. ICT-5 was restored at 17:49 hrs on the same day.

. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
5	420KV/20KV MEPL-GT-3	As per the reports submitted, 420KV/20KV MEPL GT 3 got tripped due to Inter trip from UST3 Master trip related to UST3 OLTC PRV Yph operated. OLTC PRD cables IR checked and found ok the PRV limit switches inspection done and its contacts checked and suspected on limit switches.	27-08-2026 05:10	**MEPL**: 1. Tripping of the GT-3 needs review	**MEPL**: OLTC PRD Limit switches replaced with new limit switches and its cable also new cable laid up to marshalling panel and after replacing the limit switches the Mechanical protection operation also verified Now taken back in service GT3 charged back at 12:34 hrs

	MEPL-GT-3
FIR	On 27082026 0509hrs GT3 tripped due to Inter trip from UST3 master trip operate with annunciation UST3 OLTC PRD operated after trip checked in field OLTC PRD was found in healthy condition and Transformer was in good condition
DR	DR Trigger Time:27-08-2026 05:09:21.609 Relay PICKUP, O/C Earth PU
EL	86 FAULTY ON DC-2 MCBTR ON
TR	Same as FIR

PMU Analysis:



From the PMU plot, No fault is observed during the event

Recommendations:

- MEPL advised to submit the detailed report on the incident.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
6	Tripping of 220kV Kudgi Bilagi Line-1&2	As per the reports submitted, the triggering incident was a Y-B-G fault in the 220 kV-Kudgi_NTPC-Bilagi-2 line due to Y-phase jumper becoming disconnected and touching the tower body at Tower No. 16 from Kudgi end. At Kudgi end fault was sensed in Z1 and 3 phase tripping was observed, and at Bilagi end fault was sensed in Z2 and Zone 2 time tripping was observed after 378 ms because no carrier was received at Bilagi end. During the same time 220 kV-Kudgi_NTPC-Bilagi-1 also tripped only at Bilagi end due overcurrent protection at Bilagi end.	27-08-2026 09:40	**KPTCL**: 1. Overcurrent protection operation of 220KV-KUDGI_NTPC-BILAGI-1 at Bilagi end needs review. 2. Non receiving of carrier at Bilagi end for 220KV-KUDGI_NTPC-BILAGI-2 needs review.	

220KV-KUDGI_NTPC-BILAGI-1

	KUDGI_NTPC	**BILAGI**
FIR	No tripping observed	NA
DR	DR Trigger Time:27-08-2026 09:41:17.070 L6 CRR HLTY CH-1	DR Trigger Time:27-08-2026 09:40:27.382 O/C PICKUP Ip O/C TRIP Ip, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3 EF Pickup, EF 3I0p Pickup Dis. Pickup Z3 AR B INI AR in progress, AR R INI, AR Y INI
EL	COX CH-1/CH-2 ALL DEAD POLE CARRIER SEND DISTANCE PROT R_Y_B PH 86A TRIP RELAY	NA

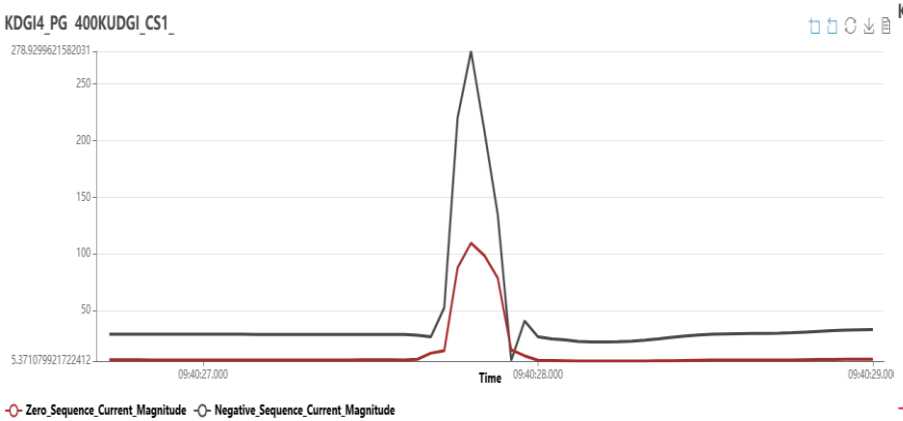
	86B TRIP RELAY MAIN CB Y-PH Y-PH INITIATION DISTANCE ZONE-1	
TR	Same as FIR	NA

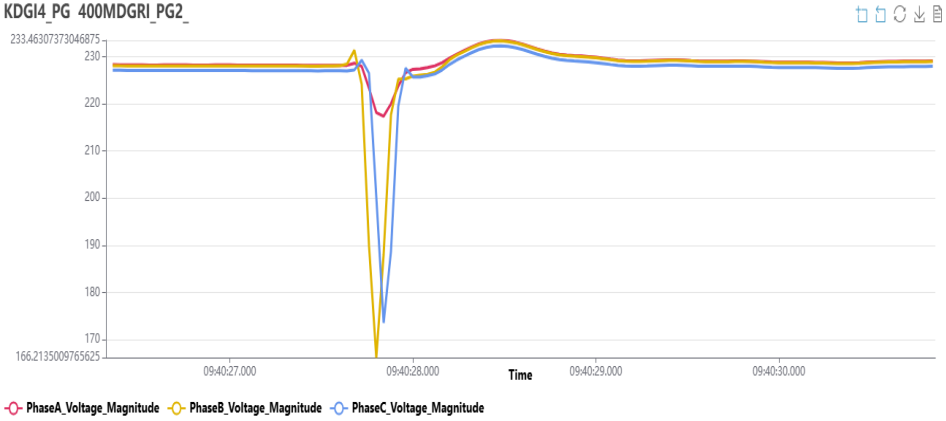
220KV-KUDGI_NTPC-BILAGI-2

	KUDGI_NTPC	**BILAGI**
FIR	NTPC Kudgi - Bilagi Line-2 tripped on Zone-1 protection due to the Y-phase jumper becoming disconnected and touching the tower body at Tower No. 16 on the Kudgi end.	NA
DR	DR Trigger Time:27-08-2026 09:40:27.686 Any Start Any Start Any Trip, Any Trip B, DIST Fwd, Z1, DIST Sig. Send L2 Y-MN CB OPEN Any Trip A, Any Trip C L9 86A OPTD L3 B-MN CB OPEN L1 R-MN CB OPEN	DR Trigger Time:27-08-2026 09:40:27.530 EF 3I0p Pickup Dis. Pickup Z3 Dis. Pickup Z2 AR R INI, AR Y INI, AR B INI Relay TRIP L1, Relay TRIP L2, Relay TRIP L3
EL	COX CH-1/CH-2 ALL DEAD POLE CARRIER SEND DISTANCE PROT R_Y_B PH 86A TRIP RELAY 86B TRIP RELAY MAIN CB Y-PH Y-PH INITIATION DISTANCE ZONE-1	NA

TR	Same as FIR	NA

PMU Analysis:





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

Deliberations:

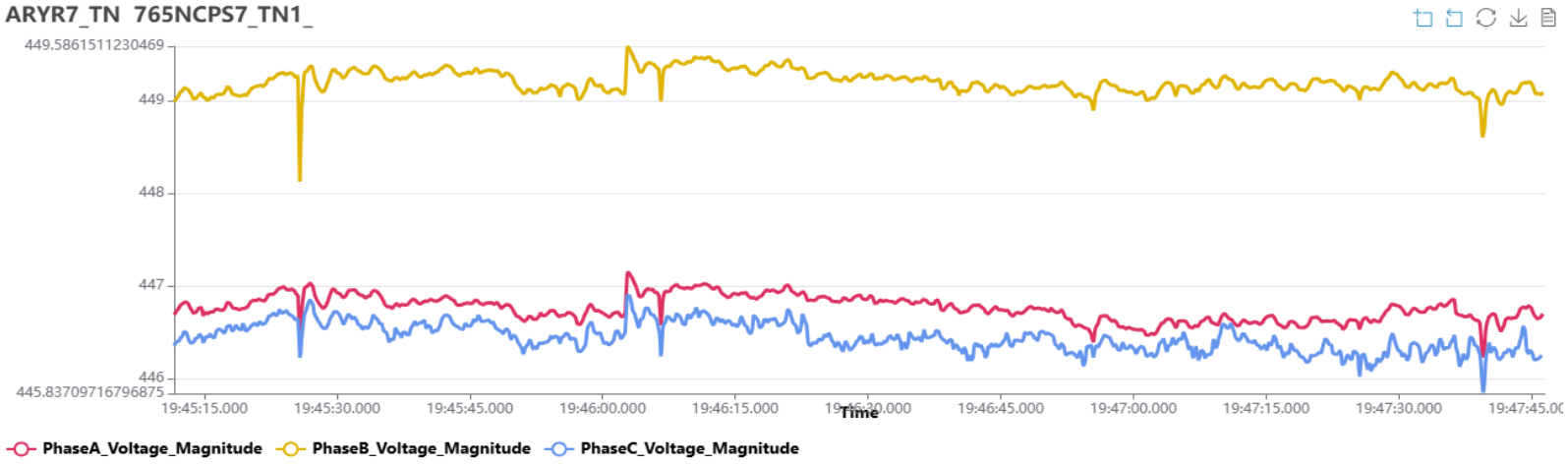
1. KPTCL informed that the triggering incident was a Y-B-G fault on 220 kV Kudgi–Bilagi Line-2 due to disconnection of the Y-phase jumper, which came in contact with the tower body at Tower No. 16 from the Kudgi end.
2. At the Kudgi end, the fault was detected in Zone-1 and three-phase tripping was observed. At the Bilagi end, the fault was detected in Zone-2 and the line tripped on Zone-2 time delay after approximately 378 ms, as the carrier signal was not received at the Bilagi end.
3. KPTCL informed that Auto-Reclosure (A/R) did not operate at the Bilagi end due to the carrier-fail condition. The carrier communication issue was subsequently rectified on 01.09.2026.
4. During the same event, 220 kV Kudgi–Bilagi Line-1 also tripped only at the Bilagi end on operation of Non-Directional Over Current protection. A VT Fuse Fail condition was persisting in the Main-2 relay.

5. KPTCL informed that due to a problem in the voltage selector switch of Kudgi Line-1 CRP at the Bilagi end, voltage was not extended to the Main-2 relay, resulting in a persistent VT Fuse Fail condition. Consequently, the Non-Directional Over Current element remained active and operated during the fault on Line-2, causing unwarranted tripping of Line-1.
6. KPTCL further informed that similar unwarranted trippings of Line-1 were observed during faults on Bilagi–Kudgi Line-2 on 27.08.2026 and 31.08.2026. The voltage selector switch issue was rectified on 01.09.2026, and no further such spurious trippings have been observed thereafter.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
7	765KV/400KV NCPS-ICT-3	As per the reports submitted, 765KV/400KV NCPS ICT 3 got tripped in the LV side on DC Earth fault after actuation of 86AL master trip relay. On inspection, it was found that the fault occurred due to defective core in interconnecting cable.	28-08-2026 19:46	**TANTRANSCO**: 1. Tripping of the ICT due to DC earth fault needs review	**TANTRANSCO**: 1. Defective wire was replaced with spare

	NCPS-ICT-3
FIR	ICT3_LV side Main CB tripped due to actuation of 86AL master relay. On inspection, HV trip lead from HV panel to LV panel earthed due to defective core in interconnecting cable . Defective wire was replaced with spare one.
DR	NA
EL	NA
TR	Same as FIR

PMU Analysis:



From the PMU plot, No fault was observed during the event

Deliberations:

1. TANTRANSCO informed that 765/400 kV NCPS ICT-3 tripped on the LV side following a DC earth fault, which resulted in operation of the 86AL master trip relay.
2. TANTRANSCO informed that, during inspection, the cause of the DC earth fault was identified as a defective core in the interconnecting control cable.
3. TANTRANSCO further informed that the defective control wire was replaced with a spare core on 28.08.2026.
4. SRPC advised TANTRANSCO to inspect the healthiness of the associated DC control cables and wiring at NCPS and take necessary preventive measures to avoid recurrence of similar inadvertent trippings.

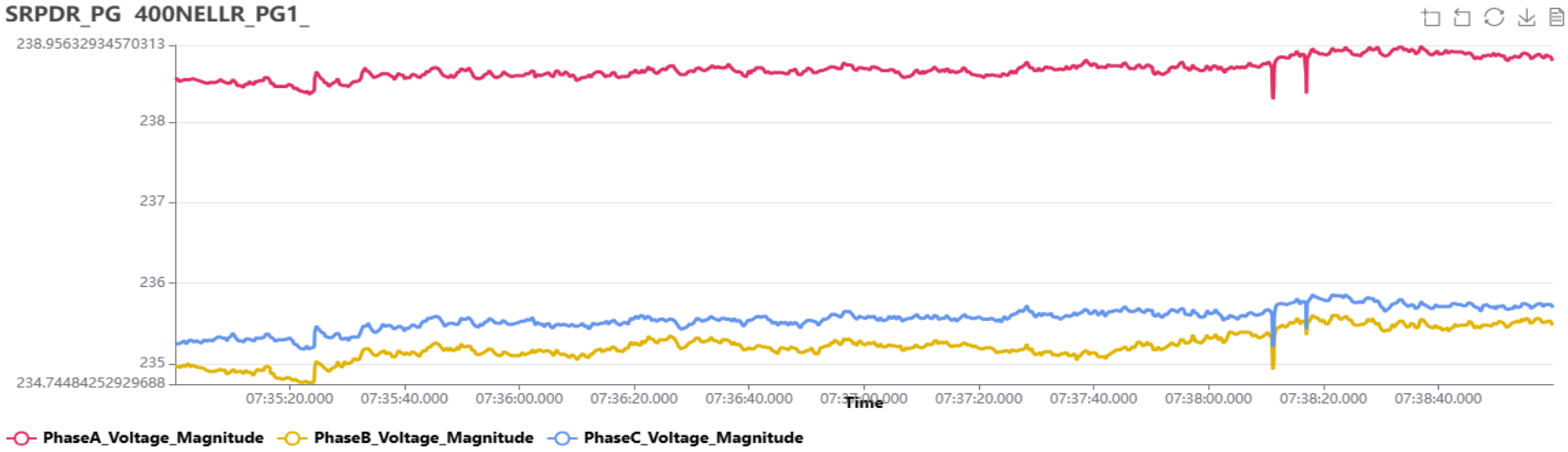
Recommendations:

- TANTRANSCO/TNPGCL to inspect the healthiness of the associated DC control cables and wiring at NCPS

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
8	400KV/230KV KORATTUR-ICT-2	As per the reports submitted, 400KV/230KV KORATTUR ICT 2 got tripped due to Buchholz relay operation after squirrel entry into the transformer Marshalling Box.	29-08-2026 07:37	**TANTRANSCO** : 1. Tripping of the ICT due to Buchholz maloperation due to rodent entry needs review	**TANTRANSCO** : 1 Buch relay checked & found No gas collection. 2 DGA test conducted & found normal 3 Gap near OTI & WTI cable entry point sealed

	KORATTUR-ICT-2
FIR	Squirrel entry observed in Transformer Marshalling box through a hole in between OTI & WTI cable entry.
DR	DR Trigger Time:29-08-2026 07:37:50.199 Buchh Tr Buchh Tr MAIN CB R OPEN, MAIN CB Y OPEN MAIN CB B OPEN TIE CB Y OPEN, TIE CB B OPEN TIE CB R OPEN VTFF OPTD VTFF OPTD
EL	NA
TR	Same as FIR

PMU Analysis:



From the PMU plot, It can be observed that there is no fault

Deliberations:

1. TANTRANSCO informed that 400/230 kV Korattur ICT-2 tripped due to operation of the Buchholz relay following entry of a squirrel into the transformer marshalling box.
2. TANTRANSCO informed that the Buchholz relay was checked after the incident and no gas accumulation was observed.
3. TANTRANSCO further informed that DGA of the transformer oil was carried out and the results were found normal.
4. During inspection, a gap was observed near the OTI/WTI cable entry in the marshalling box, which facilitated entry of the squirrel.
5. SRPC advised TANTRANSCO to properly seal all cable entry points and openings in transformer marshalling boxes and inspect similar installations at 400kV Korattur SS to prevent ingress of animals/rodents and recurrence of such inadvertent trippings.

Recommendations:

- TANTRANSCO to properly seal all cable entry points and openings in transformer marshalling boxes and inspect similar installations at 400kV Korattur SS

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
9	Tripping of 220KV-RAMAGUNDAM-MALYALAPALLI-4 during fault in 220KV-RAMAGUNDAM-MALYALAPALLI-3 (RAMAGUNDAM ICT-5)	As per the reports submitted, the triggering incident was a B-G fault in the 220KV-RAMAGUNDAM-MALYALAPALLI-3 feeder which is extended to 400kV/220kV Ramagundam ICT-5. At Malayapalli end the fault was sensed in Zone 2 and the line tripped after 350ms. At Ramagundam end, the fault was sensed in Z1 after tripping of the line at Malyalapalli end and the line tripped. A/R did not operate at both ends as A/R is disabled. At the same time, 220KV-RAMAGUNDAM-MALYALAPALLI-4 tripped only at Malyalapalli end on zone-4 protection.	29-08-2026 12:41	**TGTRANSCO**: Tripping of 220KV-RAMAGUNDAM-MALYALAPALLI-4 for fault in 220KV-RAMAGUNDAM-MALYALAPALLI-3	

220KV-RAMAGUNDAM-MALYALAPALLI-4

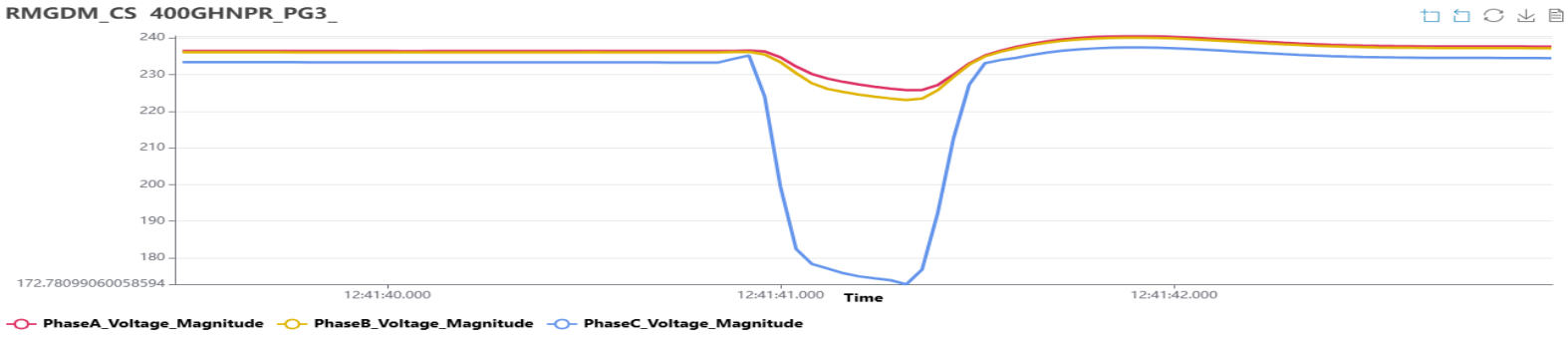
	RAMAGUNDAM	MALYALAPALLI
FIR	No fault at our end, did not trip at our end	220KV Malyalapally-NTPC(Ramagundam) Feeder-4 Tripped on B-Phase to Ground fault, Zone-4(Reverse Zone) indications at 220KV Malyalapally SS end only for through fault on 220KV Malyalapally-NTPC (Ramagundam) Feeder-3. 220KV Malyalapally-NTPC (Ramagundam) Feeder-3 Tripped on B-Phase to Ground fault, Zone-2 indications in LDP relay due to issue with telecommunication. AR kept in OFF condition as it is tie line connected to ICT.
DR	NA	DR Trigger Time:29-08-2026 12:41:17.550 Aided 1 Send, CARR SEND Any Trip, Zone 2 Trip, Zone 2 C Trip, Zone 2 N Trip, ANN DIST PROT

		OP, TO 86 TRIP RELAY, TO BBPNL LBBINIT, TO B PHASE TRIP, ANN B PH RLY OP, ANYTRIP FEEDBACK DR Trigger Time:29-08-2026 12:41:08.483 Any Start Z4 Any Trip, DIST Trip A, DIST Trip B, DIST Trip C
EL	NA	Same as DR
TR	Same as FIR	NA

400KV/220KV RAMAGUNDAM-ICT-5

	RAMAGUNDAM-ICT-5
FIR	B phase to earth fault, Z1 sensed, fault current 6.08KA
DR	DR Trigger Time:29-08-2026 12:41:18.109 Aided 1 Send, CARRIER SEND Any Trip, Zone 1 Trip, Zone 1 C Trip, Zone 1 N Trip, 86 R1 TRIP, 86 Y1 TRIP, 86 B1 TRIP, 1PH TRIP, PROT. OPTD_ANN, SPARE
EL	Same as DR
TR	Same as FIR

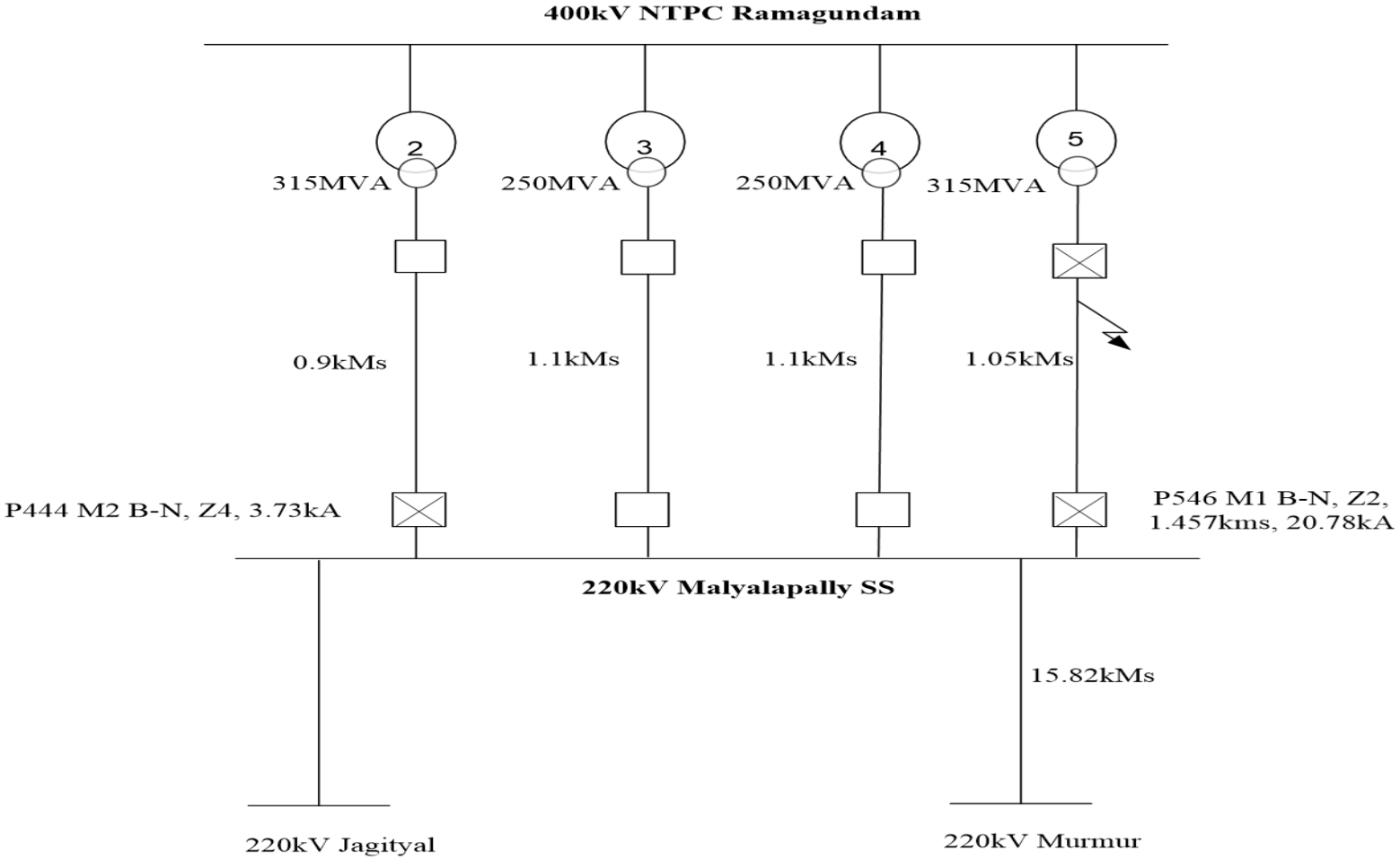
PMU Analysis:



From the PMU plot B-G fault can be observed with a delayed fault clearance of around 350ms.

Deliberations:

1. TGTRANSCO informed that the triggering incident was a B-G fault on 220 kV Ramagundam–Malyalapalli Feeder-3, which is extended to 400/220 kV Ramagundam ICT-5. At the Malyalapalli end, the fault was detected in Zone-2 and the line tripped after approximately 350 ms.



2. At the Ramagundam end, the fault was subsequently detected in Zone-1 and the feeder tripped. Auto-Reclosure (A/R) did not operate at either end as A/R was disabled.
3. TGTRANSCO informed that the Zone-2 time-delayed operation at the Malyalapalli end occurred due to non-availability of OPGW connectivity with the NTPC-end line protection relays.
4. During the same incident, 220 kV Ramagundam–Malyalapalli Feeder-4 tripped only at the Malyalapalli end on reverse Zone-4 protection with a time delay of approximately 350 ms.
5. TGTRANSCO informed that OPGW connectivity with the NTPC-end line protection relays would be established in coordination with NTPC officials during the second week of October 2026.
6. SRPC advised TGTRANSCO to complete the OPGW connectivity at the earliest and ensure proper operation of the carrier-aided protection scheme.

Recommendations:

- TGTRANSCO to complete the OPGW connectivity at the earliest and ensure proper operation of the carrier-aided protection scheme.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
10	Tripping of 220 kV-KUDGI-BILAGI 1& 2	As per the reports submitted, the triggering incident was a R-G fault in the 220 KV Kudgi-Bilagi-2 line. At Bilagi end fault was sensed in Z1 with some delay line tripped at Bilagi end in all three phases without any A/R operation, at Kudgi end fault was sensed Z1 and R pole got opened. At Kudgi end A/R successfully operated and line tripped on persistent fault. During the same time 220 kV Kudgi-Bilagi-1 line also tripped only at Bilagi end due to overcurrent operation for the R-G fault in the 220 kV Kudgi-Bilagi-2 line.	31-08-2026 04:17	**KPTCL**: 1. Overcurrent operation at Bilagi end in 220 kV Kudgi-Bilagi-1 due to through fault in 220 kV Kudgi-Bilagi-2 needs review. 2. Non operation of A/R at Bilagi end due to R-G fault in 220 kV Kudgi-Bilagi-2 needs review.	**KPTCL**: 1. M2 relay logic configuration issue was resolved

220KV-KUDGI_NTPC-BILAGI-1

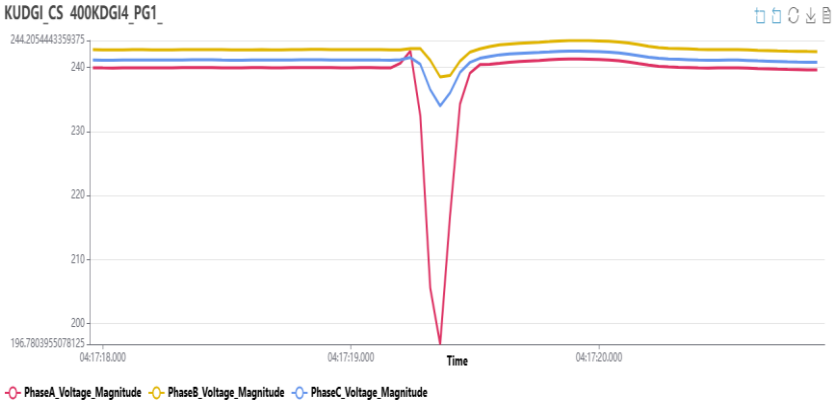
	KUDGI_NTPC	BILAGI
FIR	NTPC KUDGI Bilagi line 1 tripped @ 04:07 at Bilagi end on Overcurrent, No disturbance recorded at Kudgi end breaker remained in close condition at Kudgi end.	Bilagi-Kudagi line-1 tripped due to M2 relay mal operation at Bilagi end
DR	DR Trigger Time:31-08-2026 04:17:19.285 Any Start DIST Fwd, Z3	DR Trigger Time:31-08-2026 04:17:19.078 O/C PICKUP Ip EF Pickup, EF 3I0p Pickup O/C TRIP Ip, Relay TRIP L1, Relay TRIP L2, Relay TRIP L3 AR R INI, AR B INI AR in progress, AR Y INI
EL	SOFT INITIATION (CB CLOSE CMD) R-PH POSITION DT SEND CH1/2 R-PH INITIATION DISTANCE PROT R-PH	NA

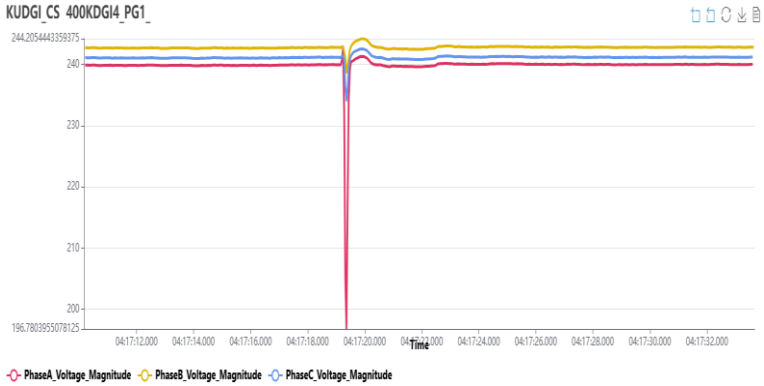
	CARRIER SEND	
TR	Same as FIR	NA

220KV-KUDGI_NTPC-BILAGI-2

	KUDGI_NTPC	**BILAGI**
FIR	04:17:19 LINE#2 TRIPPED DUE TO EARTH FAULT(Rph-G), ZONE-1 OPERATED ON DISTANCE PROTECTION, FAULT LOCATION-4.368 KM.	Bilagi-Kudagi line-2 tripped at both ends sensing RN fault in ZOne-1
DR	DR Trigger Time:31-08-2026 04:17:26.013 L24 1-PH TR PERM	DR Trigger Time:31-08-2026 04:17:19.078 EF 3I0p Pickup Dis. Pickup Z2, Dis. Pickup Z3 Relay TRIP L1 Relay TRIP L2, Relay TRIP L3 Dis.Pic.Z1 AR R INI AR Y INI, AR B INI
EL	SOFT INITIATION (CB CLOSE CMD) R-PH POSITION DT SEND CH1/2 R-PH INITIATION DISTANCE PROT R-PH CARRIER SEND	NA
TR	Same as FIR	NA

PMU Analysis:





From the PMU plot R-G fault in the 220 kV Kudgi-Bilagi-2 line can be observed with no delayed fault clearance.

Deliberations:

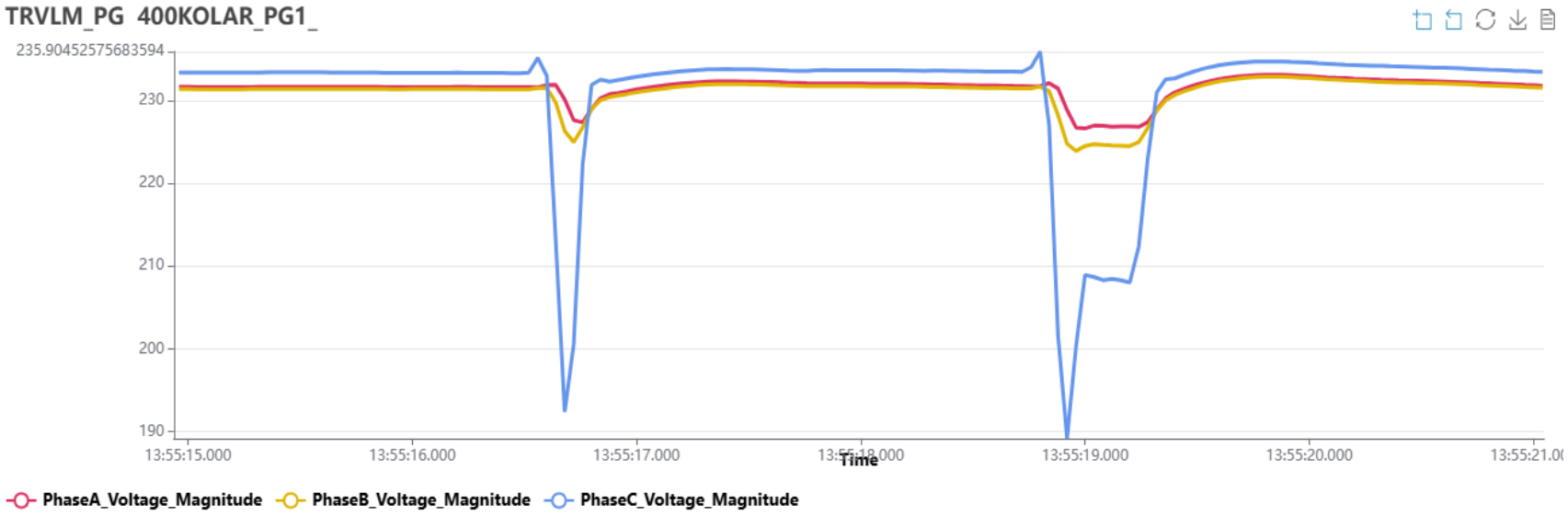
1. KPTCL informed that the triggering incident was an R-G fault on 220 kV Kudgi–Bilagi Line-2. At the Bilagi end, the fault was detected in Zone-1 with some delay and three-phase tripping was observed. Auto-Reclosure (A/R) was blocked due to carrier-fail condition. The relay recorded a fault current of about 4.15 kA and fault location of approximately 26.96 km.
2. At the Kudgi end, the fault was detected in Zone-1 and R-pole tripped. A/R operated successfully; however, as the fault was persistent, the line subsequently tripped.
3. KPTCL informed that the carrier communication issue responsible for blocking of A/R at the Bilagi end was rectified on 01.09.2026.
4. During the same incident, 220 kV Kudgi–Bilagi Line-1 tripped only at the Bilagi end on operation of Non-Directional Over Current protection. A VT Fuse Fail condition was persisting in the Main-2 relay of Line-1.
5. KPTCL informed that, due to a problem in the voltage selector switch of Kudgi Line-1 CRP at the Bilagi end, voltage was not extended to the Main-2 relay. Consequently, under the persistent VT Fuse Fail condition, the Non-Directional Over Current element remained active and operated for the fault on Line-2, resulting in unwarranted tripping of Line-1.
6. KPTCL further informed that similar unwarranted operation was observed during faults on Line-2 on 27.08.2026 and 31.08.2026. The voltage selector switch issue was rectified on 01.09.2026 and no further such spurious trippings were observed thereafter.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
11	400KV-ALAMATHY-SUNGAVARACHATRAM-2	As per the reports submitted, the triggering incident was B-G fault in the line. At Sungavarachatram end, the fault was sensed in Z1 and B pole got opened and A/R operated successfully and tripped due to subsequent B-G fault during A/R reclaim time. At Alamathy end, the fault was sensed in carrier aided Z2 and B pole got opened A/R operated successfully and the fault was sensed in Z2, but since the carrier time has elapsed (since Z1 operated at remote end a bit earlier) led to the tripping at Alamathy end on Z2 time trip after around 400ms.	01-09-2026 13:47	**TANTRANSCO** : 1. Delayed fault clearance during at ALAMATHY end during AR operation needs review	

	ALAMATHY	**SUNGAVARACHATRAM**
FIR	At Alamathy end, Main CB under line clear. In antecedent condition, Line was in service through Tie breaker. For a single line to ground fault, Tie CB AR successful within reclaim due to subsequent fault in B phase Lockout trip initiated	At SVC end, Main CB only in service, Tie CB not yet commissioned For a single line to ground fault in B phase, Main CB B pole opened.AR successful. Within reclaim time, due to subsequent fault in B phase Lockout trip initiated
DR	DR Trigger Time:01-09-2026 13:55:16.655 Any Start Z3 DIST. Chan Recv, DI12 CARIER RECE Any Trip, Any Trip C, Z2 A/R 1P In Prog A/R Close	DR Trigger Time:01-09-2026 13:55:16.947 Trip Output C, Zone 1 Trip, CARRIER SEND-CH1, MCB-CPh Trip, TCB-APh Trip, TCB-BPh Trip, TCB-CPh Trip, Aided 1 Send, Any Trip AR Start, AR 1pole in prog MCB-A/R CLOSE MCB Closed-CPh

	DI1 MCB APH CLS, DI3 MCB CPH CLS DI2 MCB BPH CLS DI7 TCB CPH CLS Any Start DIST. Chan Recv, DI12 CARIER RECE Z3 Z2	Trip Output A, Trip Output B, Trip Output C, Zone 1 Trip, CARRIER SEND-CH1, MCB-APh Trip, MCB-BPh Trip, MCB-CPh Trip, MCB-3PH.TRIP, TCB-APh Trip, TCB-BPh Trip, TCB-CPh Trip, TCB-3PH.TRIP, Aided 1 Send, Any Trip AR Start A/R BLOCK
EL	LINE U/V On 752 A_B_C CLOSED On 852 C CLOSED On ARC BLOCK On Cont Op 24 On DIR E/F BLK On Z2Z3 Pkp On Main CB C op On	Same as DR
TR	Same as FIR	Same as FIR

PMU Analysis:



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

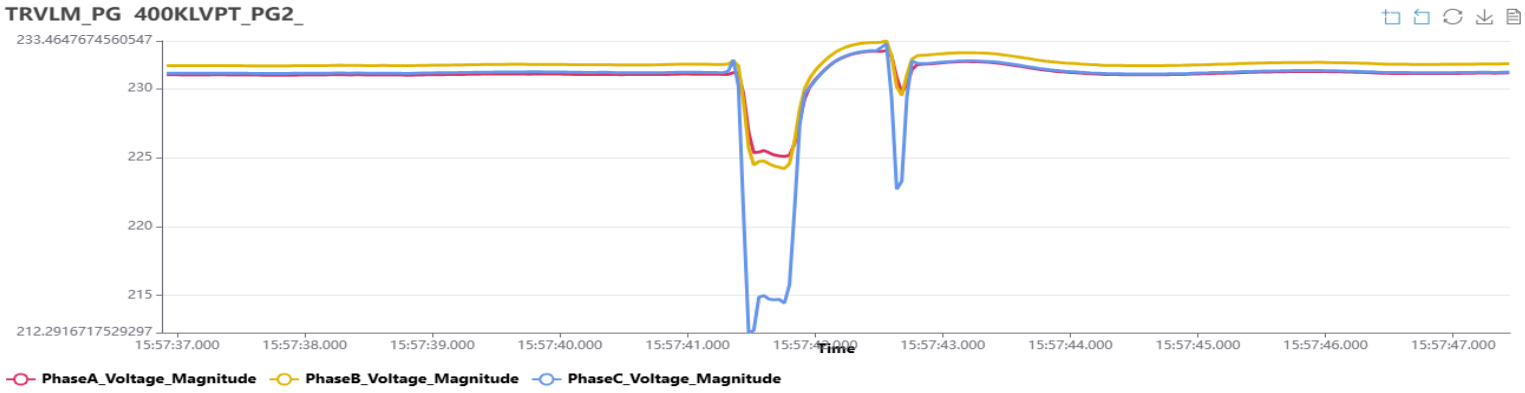
Deliberations:

1. TANTRANSCO informed that the triggering incident was a B-G fault on the line. At the Sunguvarchatram end, the fault was detected in Zone-1, resulting in B-pole tripping. Auto-Reclosure (A/R) operated successfully; however, a subsequent B-G fault occurred during the A/R reclaim time, resulting in tripping of the line.
2. At the Alamathy end, the initial fault was detected through carrier-aided Zone-2 protection, resulting in B-pole tripping. A/R subsequently operated successfully.
3. TANTRANSCO informed that following A/R, the subsequent fault at the Alamathy end was initially detected in Zone-3 and subsequently evolved into Zone-2. The carrier signal persisted for about 68 ms; however, the carrier duration elapsed before Zone-2 pickup, and the fault was ultimately cleared on Zone-2 time delay after approximately 350–400 ms.
4. It was informed that the carrier signal had been initiated based on the remote-end Zone-1 operation, which occurred slightly earlier, and therefore was no longer available when the fault subsequently evolved into Zone-2 at the Alamathy end.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
12	400KV-ALAMATHY-SUNGAVARACHATRAM-2	As per the reports submitted, the triggering incident was B-G fault in the line. At Sungavarachatram end, the fault was sensed in Z1, B pole got opened and after successful A/R operation the line tripped on persistent fault. At Almathy end, the fault was sensed in Z2 only after the Z1 was sensed at remote end and breaker opened at remote end (and the carrier receipt was elapsed) and the line tripped in all three phases because of Zone 2-time trip after 400 ms.	02-09-2026 15:57	**TANTRANSCO** : 1. Delayed fault clearance during the event needs review	**TANTRANSCO** : Tree Clearance done at loc 108 & 109

	ALAMATHY	SUNGAVARACHATRAM
FIR	For a single line to ground fault in B phase, Alamathy end sensed the fault in Zone.3 with carrier receive and after evolved into zone.2. Hence zone.2 trip initiated	In Main CB only in service. Tie CB Not yet commissioned. For a single line to ground fault in B phase TOR operated
DR	DR Trigger Time:02-09-2026 15:57:41.443 Any Start DIST. Chan Recv, DI12 CARIER RECE Z3 Z2 Any Trip, Any Trip A, Any Trip B, Any Trip C, 3P Trip BAR DIST. Chan Recv, DI12 CARIER RECE	DR Trigger Time:02-09-2026 15:57:41.836 Trip Output C, Zone 1 Trip, CARRIER SEND-CH1, MCB-CPh Trip, TCB-APh Trip, TCB-BPh Trip, TCB-CPh Trip, Aided 1 Send, Any Trip AR Start, AR 1pole in prog Trip Output A, Trip Output B, Trip Output C, Zone 1 Trip, TOR Trip Zone 1, TOR Trip Zone 2, MCB Closed-CPh, CARRIER SEND-CH1, MCB-APh Trip, MCB-BPh Trip, MCB-CPh Trip, MCB-3PH.TRIP, TCB-APh Trip, TCB-BPh Trip, TCB-CPh Trip, TCB-3PH.TRIP, Aided 1 Send, Any Trip AR Start A/R BLOCK
EL	Same as DR	Same as DR
TR	Same as FIR	Same as FIR

PMU Analysis:



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

Deliberations:

1. TANTRANSCO informed that the triggering incident was a B-G fault on the line. At the Sunguvarchatram end, the fault was detected in Zone-1, resulting in B-pole tripping. Auto-Reclosure (A/R) operated successfully; however, as the fault persisted, the line subsequently tripped.
2. At the Alamathy end, the fault was detected in Zone-2 only after Zone-1 operation and breaker opening at the Sunguvarchatram end. By that time, the carrier signal received from the remote end had elapsed.
3. Consequently, carrier-aided tripping was not available at the Alamathy end and the line tripped in all three phases on Zone-2 time-delayed protection after approximately 400 ms.
4. The Forum observed that the delayed fault clearance at the Alamathy end needs to be reviewed, particularly with respect to the carrier-aided protection logic and timing coordination between both ends.
5. SRPC advised TANTRANSCO to review the carrier-aided protection logic/timing to ensure faster clearance of persistent faults at the remote end.

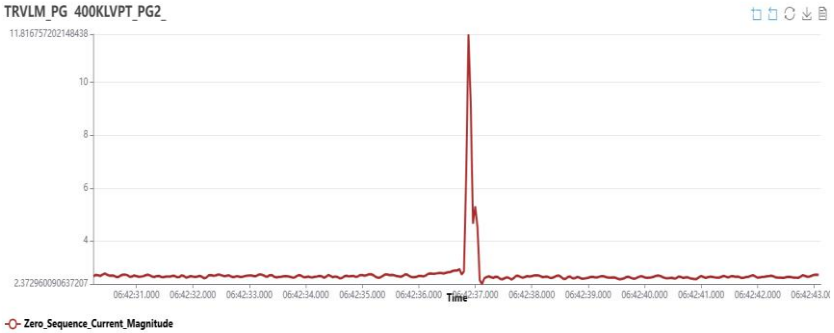
Recommendations:

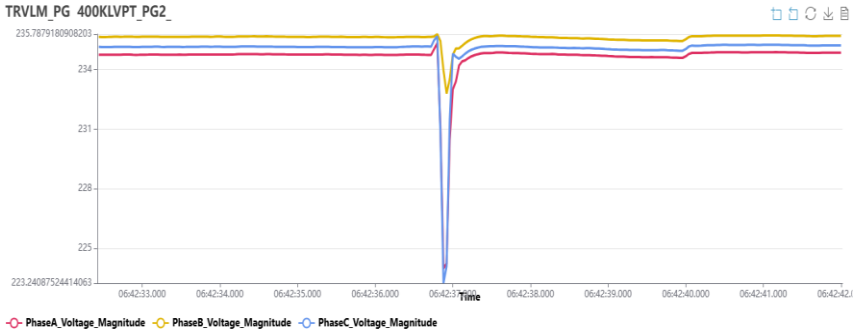
- TANTRANSCO to review the carrier-aided protection logic/timing to ensure faster clearance of persistent faults at the remote end.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
13	400KV-ALAMATHY-TIRUVALAM_TN-2	As per the reports submitted, the triggering incident was an R-B-G fault in the line due to a jumper cut. At Alamathy end, the fault was sensed in Z1, resulting in three-phase tripping of the line, and a carrier signal was sent to the remote end. At Tiruvalam end, initially, an R-G fault was sensed in Z2; however, the carrier signal was not received, and the fault was cleared without tripping any pole. Subsequently, another R-G fault was sensed in Z1 at Tiruvalam end, resulting in three-phase tripping.	03-09-2026 06:42	**TANTRANSCO** : 1. Non receipt of carrier at Tiruvalam end needs review. 2. 3 phase tripping after sensing R-G fault needs review 3. Non-operation of A/R at Tiruvalam end needs review.	**TANTRANSCO** : Jumper cut attended at Loc No.146

	ALAMATHY	**TIRUVALAM**
FIR	For a line-to-line fault Lockout trip initiated	Lockout trip initiated due to subsequent fault within dead time
DR	DR Trigger Time:03-09-0026 06:41:23.280 Any Start Any Trip, Any Trip A, Any Trip B, Any Trip C, 3P Trip, Z1, DIST Sig. Send External Trip A External Trip C External Trip B	DR Trigger Time:03-09-2026 06:42:36.879 DIST Fwd, Z2 V>1 Start Any Trip, DIST Trip A, DIST Fwd, Z1, DIST Sig. Send Any Pole Dead All Pole Dead VTS Fast DIST Fwd, Z1
EL	A/R Lockout ON A/R Trip 3P ON All Pole Dead ON Any Pole Dead ON CB Aux B ON CB Aux A ON 3P Trip ON Any Trip A_B_C ON Z1 ON DIST Trip A_B_C ON General Alarm ON I> Start Any A ON I>4 Start ON	Same as DR
TR	Same as FIR	Same as FIR

PMU Analysis:





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

Deliberations:

1. TANTRANSCO informed that the triggering incident was an R-B-G fault on the line due to jumper cut. At the Alamathy end, the fault was detected in Zone-1, resulting in three-phase tripping of the line, and carrier signal was sent to the Tiruvalam end.
2. At the Tiruvalam end, the initial R-G fault was detected in Zone-2. However, carrier-aided tripping was not observed and the fault got cleared following opening of the breaker at the Alamathy end, without tripping of any pole at Tiruvalam. Subsequently, another R-G fault was detected in Zone-1 at the Tiruvalam end, resulting in three-phase tripping.
3. TANTRANSCO informed that carrier send/receive signals were verified from the Main-1 relay DRs at both ends.
4. TANTRANSCO further informed that at the Tiruvalam end, the first R-phase fault was observed at 06:42:36.892 hrs and the subsequent R-phase fault was observed at around 06:42:37.003 hrs. Due to the subsequent fault occurring in close succession, A/R did not operate and three-phase tripping was initiated.
5. The Forum observed that the non-receipt/non-operation of carrier-aided tripping for the initial Zone-2 fault at the Tiruvalam end.
6. SRPC advised TANTRANSCO to analyse the complete protection sequence, including carrier send/receive logic, three-phase tripping logic and A/R non-operation at the Tiruvalam end.

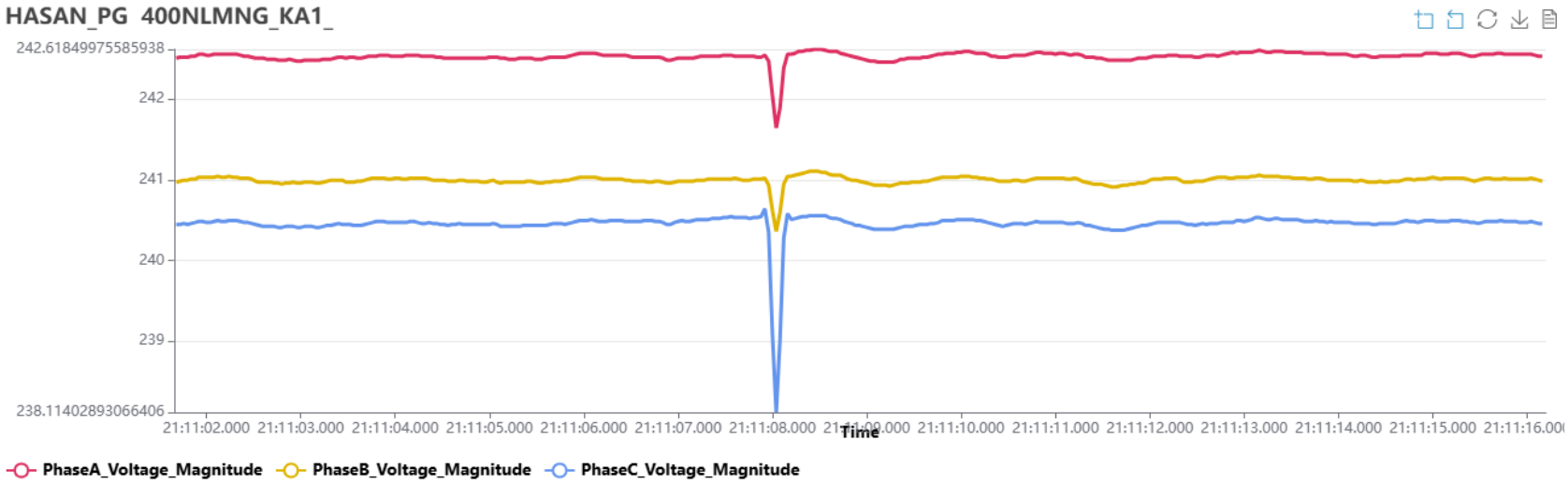
Recommendations:

- TANTRANSCO to analyse the complete protection sequence, including carrier send/receive logic, three-phase tripping logic and A/R non-operation at the Tiruvalam end.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
14	400KV/220KV KADANDALE-ICT-1	As per the reports submitted, the 400 kV/220 kV Kadandale ICT-1 tripped due to REF protection operation during a through fault on the 220 kV Kadandale–Bajpe Line-1, attributed to a CT polarity issue.	05-09-2026 21:12	**KPTCL** : 1. REF protection triggering due to through fault needs review.	

	KADANDALE-ICT-1
FIR	ICT1 tripped under REFR with Power swing indication 220kv Kadandale-Bajpe Line1
DR	DR Trigger Time:05-09-2026 21:11:08.046 DEFLPDEF1 START DEFLPDEF1 TRIP GR-A INTERTRIP OPTD
EL	OIL FLOW FAIL/REVERSE PUMP GR-A ON OIL FLOW FAIL/REVERSE PUMP GR-B ON COOLER 415V AC STANDBY SUPPLY FAIL ON OLTC CONTROL S/P FAIL On Disconn. open interlocked On R-PH CB OPEN Y-PH CB OPEN B-PH CB OPEN TIE R-PH CB OPEN TIE Y-PH CB OPEN TIE B-PH CB OPEN
TR	Same as FIR

PMU Analysis:



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

Deliberations:

1. KPTCL informed that the newly commissioned 400 kV Kadandale Substation, along with 2 × 500 MVA ICTs, was commissioned on 25.08.2026.
2. KPTCL informed that on 05.09.2026 at 21:11:08 hrs, 500 MVA ICT-1 tripped on operation of REF protection during a through-fault condition associated with a fault on the Kavoor–Adyar 110 kV line emanating from Kavoor bus. The neutral current recorded was approximately 182.59 A. No load loss occurred as ICT-2 remained in service.
3. KPTCL informed that ICT-1 was restored at 23:02 hrs on the same day. During commissioning, REF stability had been successfully checked based on the ICT manufacturer's as-built drawings.
4. However, during post-event verification of the REF circuitry, it was observed that the actual polarity of the bushing CTs was different from that indicated in the OEM as-built drawing. Reversal of the neutral bushing CT polarity marking was suspected.
5. KPTCL informed that an outage of ICT-1 was availed on 07.09.2026 and the neutral bushing CT polarity was corrected by reversing the CT secondary connections. In view of the possibility of a similar issue, corresponding polarity correction was also carried out in ICT-2 as a preventive measure.

6. The Forum observed that the incident was attributable to CT polarity mismatch in the REF scheme, resulting in operation of REF protection during an external through fault.

7. SRPC advised KPTCL to ensure that CT polarity is physically verified during commissioning and not solely based on OEM drawings. Similar verification may also be carried out for other newly commissioned ICTs to avoid recurrence of such maloperations.

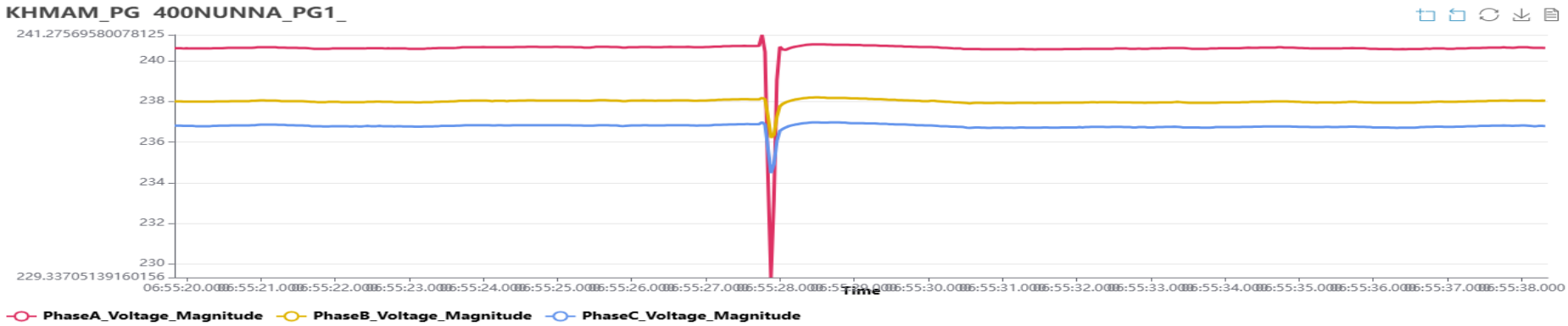
Recommendations:

- KPTCL to ensure that CT polarity is physically verified during commissioning and not solely based on OEM drawings. Similar verification may also be carried out for other newly commissioned ICTs to avoid recurrence of such maloperations.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
15	400KV/220KV JULURUPADU-ICT-2	As per the reports submitted, 400KV/220KV JULURUPADU ICT 2 got tripped on Buchholz relay operation for a through fault.	07-09-2026 06:55	**TGTRANSCO** : 1. Tripping of the ICT on Buchholz protection during through fault needs review	

	JULURUPADU-ICT-2
FIR	315MVA ICT-2 tripped on operation of Buchholz relay protection. Observed spurious Buchholz trip ON & OFF in relay events. All transformer testings were done and no fault found and charged the ICT.
DR	DR Trigger Time:07-09-2026 06:55:28.119 L4 86A RLY OPTD
EL	BUCH TRP On 86A OPTD On
TR	Same as FIR

PMU Analysis:



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

Deliberations:

1. TGTRANSCO informed that 315 MVA, 400/220 kV Julurupadu ICT-2 tripped on operation of Buchholz protection during a through-fault condition.
2. TGTRANSCO informed that an R-G fault had occurred on 220 kV Julurupadu–Peddagopathi Line-2 approximately 300 ms prior to tripping of ICT-2.
3. TGTRANSCO further informed that the Buchholz relay had not physically operated and no gas accumulation was observed. However, spurious Buchholz Trip ON/OFF events were observed in the relay/event records.
4. All relevant transformer tests were carried out and the results were found satisfactory. Subsequently, ICT-2 was charged and restored to service.
5. The Forum observed that the spurious Buchholz trip indication during an external through fault needs detailed review.
6. SRPC advised TGTRANSCO to thoroughly check the Buchholz trip circuit, associated wiring, contacts/intermediate relays and DC circuitry to avoid recurrence.

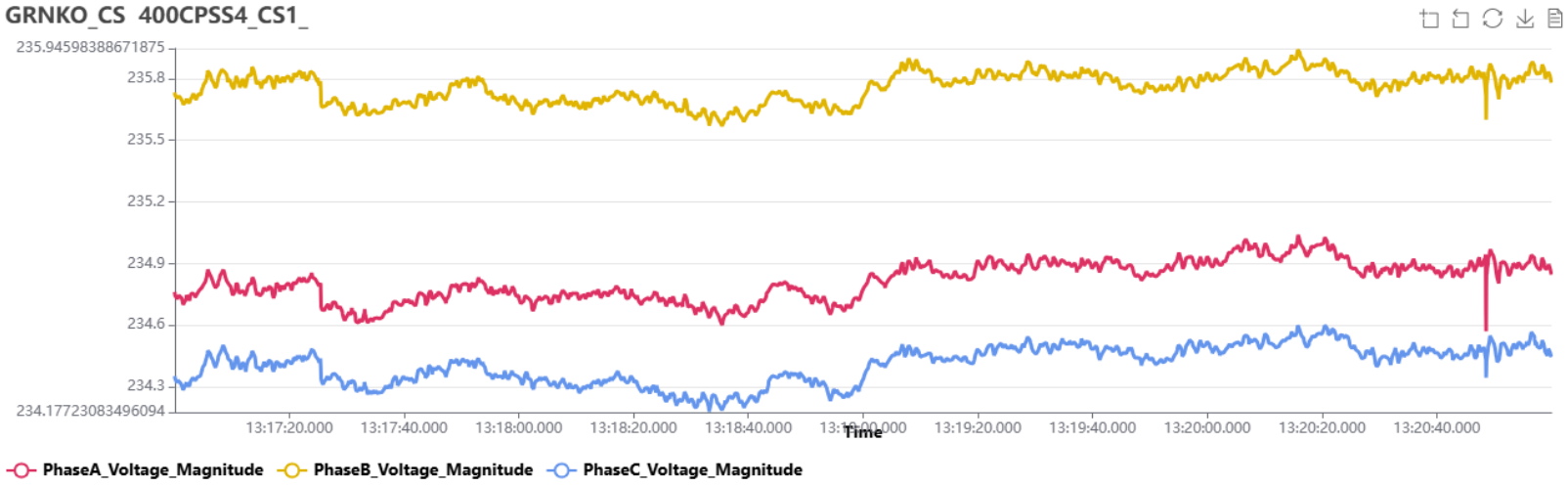
Recommendations:

- TGTRANSCO to thoroughly check the Buchholz trip circuit, associated wiring, contacts/intermediate relays and DC circuitry to avoid recurrence.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
16	400KV/11KV GREENKO_PSP-ST-1	As per communication with Greenko_PSP, the triggering incident was a phase-to-phase breaker flashover on the 11 kV incoming feeder. Since ST-1 was enabled with residual voltage protection, the flashover caused a voltage imbalance, OPEN DELTA RESIDUAL OVERVOLTAGE TRIP operated resulting in the tripping of ST-1 at both ends.	10-09-2026 13:19	**GREENKO** : 1. Tripping of the ST-1 on OPEN DELTA RESIDUAL OVERVOLTAGE TRIP needs review	

	GREENKO_PSP-ST-1
FIR	No abnormal current increase was observed on either the HV or LV side of SST-1. However, an Open Delta Voltage appeared in the protection relay. Following the configured time delay of approximately 1 second, the protection relay operated.
DR	DR Trigger Time:10-09-2026 13:19:12.618 OPEN DELTA RESIDUAL OV START OPEN DELTA RESIDUAL OV START OPEN DELTA RESIDUAL OV TRIP HV CB OPEN 86 OPERATED HV LV CB OPEN
EL	I<->O CB (1) POSITION Uo> (1) START
TR	Same as FIR

PMU Analysis:



From the PMU plot, fault was not observed.

Deliberations:

Greenko to submit the detailed report on the Tripping of the ST-1 on OPEN DELTA RESIDUAL OVERVOLTAGE TRIP on 10.09.2026.

Recommendations:

- Greenko to submit the detailed report on the Tripping of the ST-1 on OPEN DELTA RESIDUAL OVERVOLTAGE TRIP on 10.09.2026.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
17	400KV/11KV GREENKO_PSP-ST-1	As per communication with Greenko_PSP, the triggering incident was a phase-to-phase breaker flashover on the 11 kV incoming feeder. Since ST-1 was enabled with residual voltage protection, the flashover caused a voltage imbalance, OPEN DELTA RESIDUAL OVERVOLTAGE TRIP operated resulting in the tripping of ST-1 at both ends.	10-09-2026 19:28	**GREENKO** : 1. Tripping of the ST-1 on OPEN DELTA RESIDUAL OVERVOLTAGE TRIP needs review	

	GREENKO_PSP-ST-1
FIR	A malfunction of the R-phase pole in the SFC Input Transformer outgoing feeder VCB caused unintended conduction despite the circuit breaker being in the OPEN state. As a result, leading to a disturbance in the MV switchgear PT open-delta circuit.
DR	DR Trigger Time:10-09-2026 19:28:43.155 OPEN DELTA RESIDUAL OV START LV CB CLOSE OPEN DELTA RESIDUAL OV TRIP HV CB OPEN 86 OPERATED HV LV CB OPEN
EL	I<->O CB (1) POSITION Uo> (1) START CBXCBR1 switch position
TR	Same as FIR

PMU Analysis: PMU data not available during the event

Deliberations:

Greenko to submit the detailed report on the Tripping of the ST-1 on OPEN DELTA RESIDUAL OVERVOLTAGE TRIP on 10.09.2026.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
18	Tripping of Gazuwaka Pole-1&2	As per the reports submitted, the triggering incident was an auxiliary supply failure in the poles of the 500 kV Gazuwaka. Following the auxiliary supply failure, Pole 2 tripped first, followed by Pole 1.	14-09-2026 12:47	**PGCIL SR-1** : 1. Tripping of the poles and Auxiliary supply failure needs review	

HVDC 500KV GAZUWAKA Pole 1

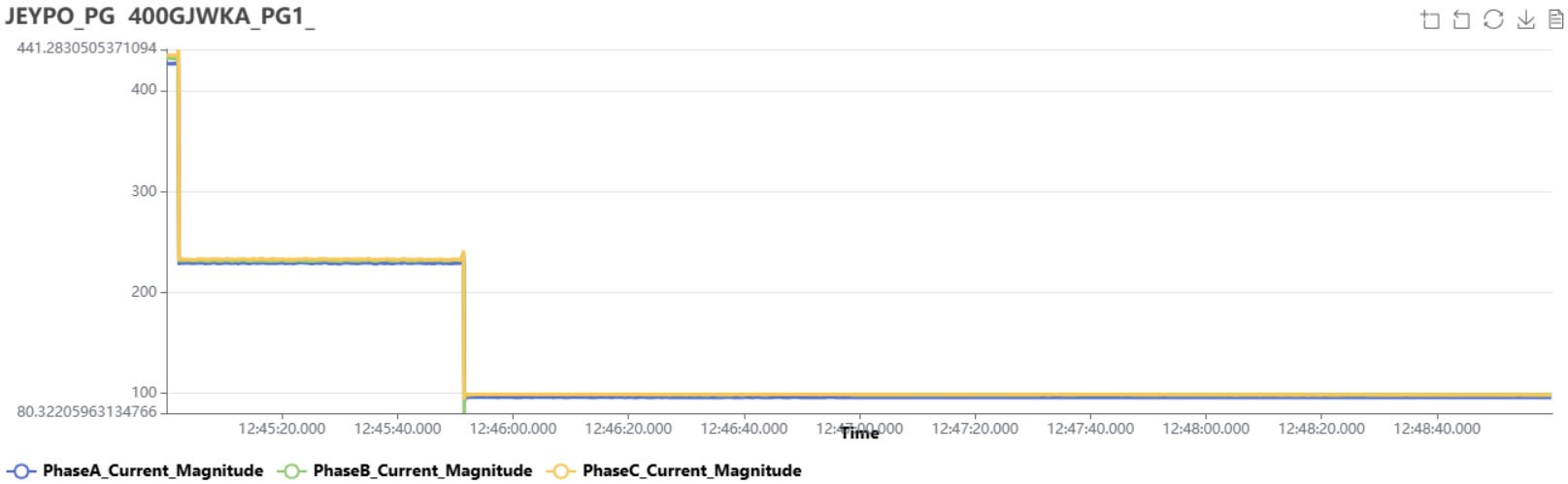
	HVDC 500KV GAZUWAKA Pole 1
FIR	Single phasing of Aux Supply
DR	DR Trigger Time:14-09-2026 12:45:01.720 CWD10Q51Open3PH, CWD30Q50Open3PH CWD10Q50OpenRPH CWD30Q51Open3PH CWD10Q50OpenBPH CWD10Q50OpenYPH
EL	MCC1 MAJOR ALARM - ACTIVE MCC2 MAJOR ALARM – ACTIVE CB R Y B PHASE - OPEN
TR	NA

HVDC 500KV GAZUWAKA Pole 2

	HVDC 500KV GAZUWAKA Pole 2
FIR	Failure of Aux supply

DR	DR Trigger Time:14-09-0026 12:42:58.516 Z_BLOCK, TRP_ACCB BPPO RETARD INH_DEBL BLOCK
EL	-
TR	NA

PMU Analysis:

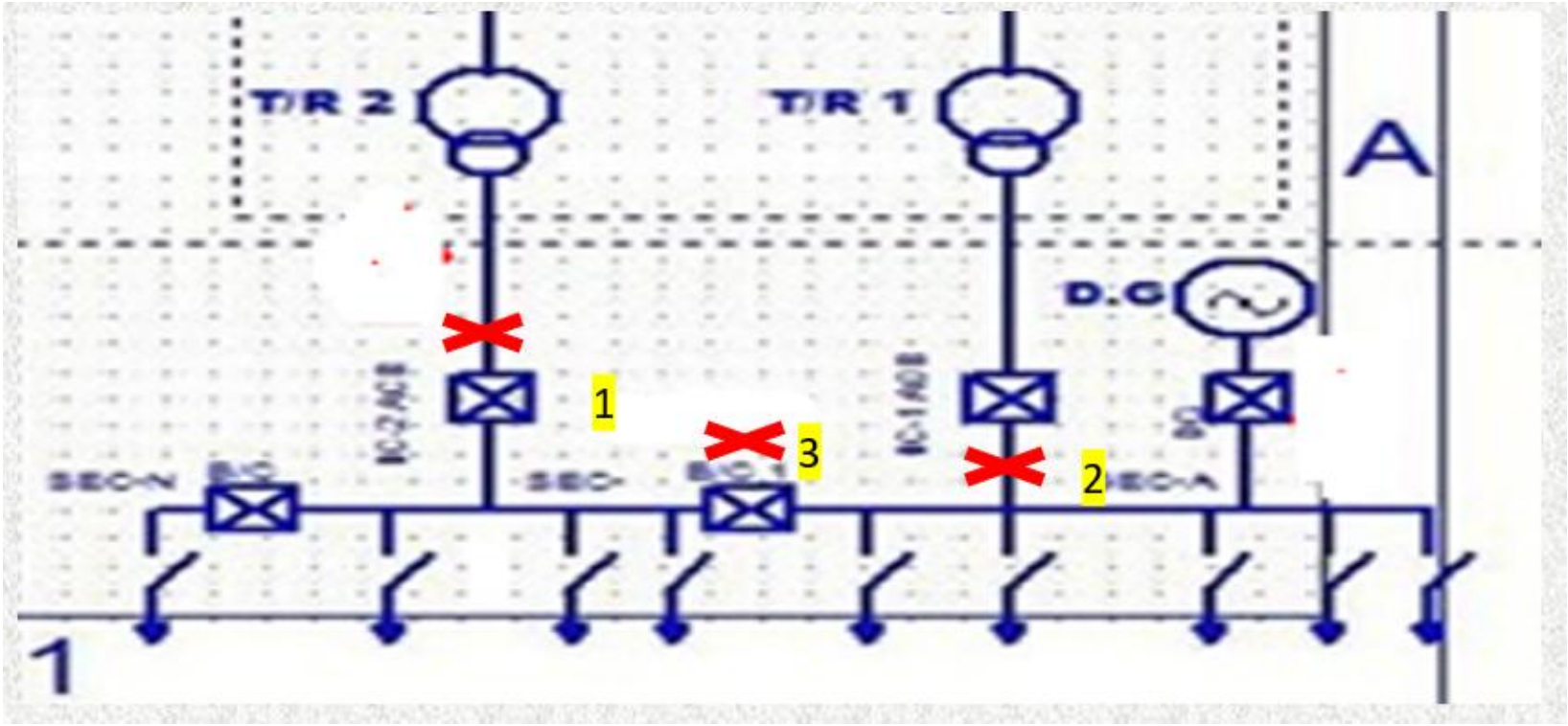


From the PMU plot, tripping of the two HVDC poles can be observed.

Deliberations:

1. PGCIL SR-I informed that on 14.09.2026 at around 04:57 hrs, ICT-1, ICT-2 and ICT-3 at Gajuwaka tripped following a B-phase fault in the APTRANSCO bus. ICT-1 and ICT-3 were subsequently restored at 07:01 hrs and 06:39 hrs, respectively, while clearance for charging of ICT-2 was awaited.

2. PGCIL SR-I informed that ICT-2 was kept under permit for carrying out portable DGA as a preventive measure. As per the existing scheme, auxiliary supply for valve cooling of Pole-1 and Pole-2 is available from the tertiary supplies of ICT-1 and ICT-2, with DG supply as standby. During the permit on ICT-2, the auxiliary supply was therefore being fed through the ICT-1 tertiary, with DG as standby.



3. At around 12:41 hrs, the Y-phase fuse of the ICT-1 tertiary auxiliary supply blew, resulting in loss of LT bus supply. The DG started following the LT supply failure; however, the DG ACB did not close automatically as the required interlock permissive from CB-2 was not available.

4. Consequently, auxiliary supply to the valve cooling system of Pole-1 and Pole-2 was lost, resulting in tripping of Pole-2 followed by Pole-1.

5. PGCIL SR-I informed that after replacement of the blown Y-phase fuse of the ICT-1 tertiary supply, auxiliary supply to the valve cooling pumps of both poles was restored. After resetting the associated alarms, Pole-2 and Pole-1 were successfully charged at 13:49 hrs and 13:51 hrs, respectively.

6. At 13:52 hrs, Pole-1 and Pole-2 were operating at about 50 MW each, with a total power flow of about 100 MW. ICT-2 was subsequently charged at 15:00 hrs, thereby restoring the second tertiary auxiliary supply source for both poles.

7. The Forum observed that the simultaneous unavailability of the ICT-2 tertiary supply and failure of the ICT-1 tertiary Y-phase fuse resulted in loss of the normal auxiliary supply, while the standby DG supply could not be established automatically due to the interlock condition.

8. SRPC advised PGCIL SR-I to review the reliability and redundancy of the auxiliary supply scheme for the valve cooling system, particularly the DG auto-changeover/interlock logic, and ensure that failure or maintenance of one auxiliary source does not lead to loss of cooling supply and consequent tripping of both poles.

9. SRPC also advised PGCIL SR-I to review the DR time synchronization at 500 kV Gazuwaka.

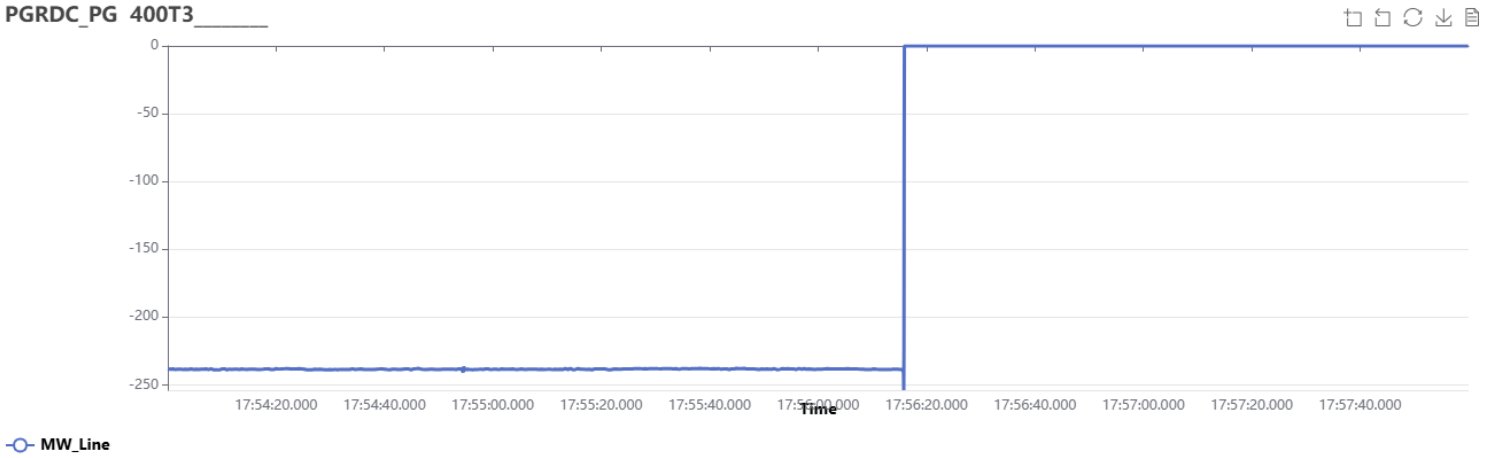
Recommendations:

- PGCIL SR-I to review the reliability and redundancy of the auxiliary supply scheme for the valve cooling system, particularly the DG auto-changeover/interlock logic, and ensure that failure or maintenance of one auxiliary source does not lead to loss of cooling supply and consequent tripping of both poles.
- PGCIL SR-I to review the DR time synchronization at 500 kV Gazuwaka

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
19	HVDC 800KV PUGALUR HVDC Pole 3	As per the reports submitted, the triggering incident was the VCU fault by Thyristor monitoring of U4. After the fault pole 3 of Pugalur HVDC tripped.	14-09-2026 18:15	**PGCIL SR-2** : 1. Tripping of the pole needs review	

	HVDC 800KV PUGALUR HVDC Pole 3
FIR	At 17:56:15 hrs, RP Pole-3 Tripped at Pugalur end due to VCU Fault by Thyristor monitoring of U4 (R-Phase Delta Side Module).
DR	VCU Faulty. Fault code 2359296 P3 Emergency Stop Initiated
EL	Tap changer no load control on Own VCU Failure Detected in VCU:s VCD_U4 IP trip detected in VCU:s VCD U4 Protective Y-block Ordered
TR	Same as FIR

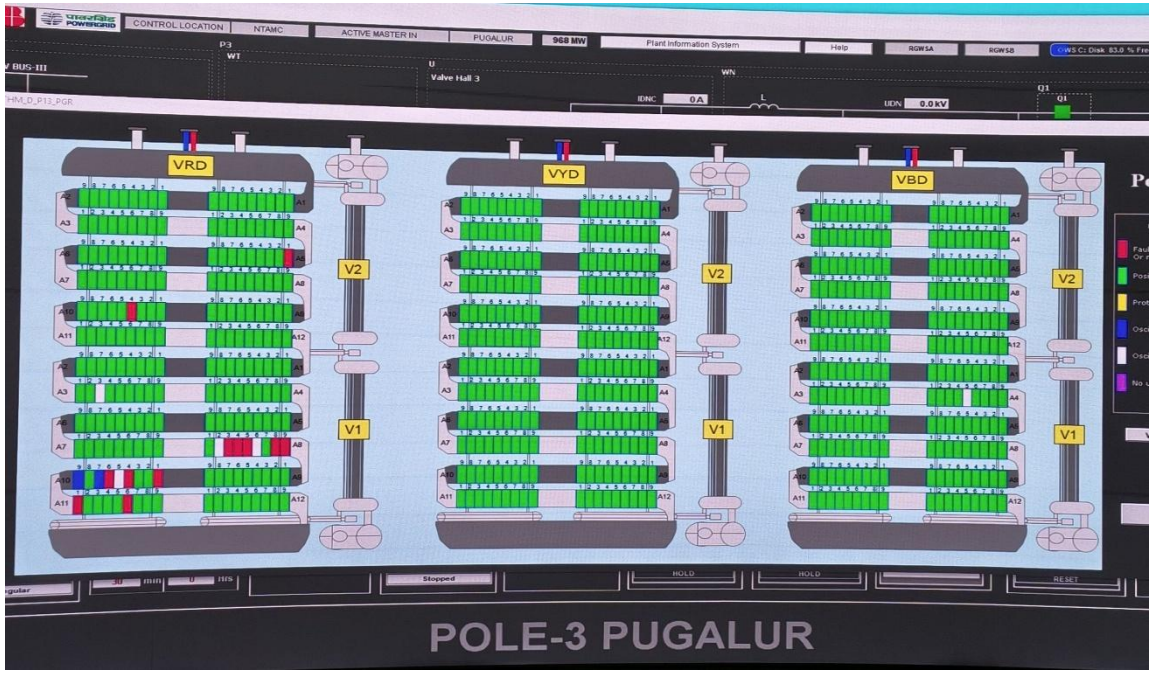
PMU Analysis:

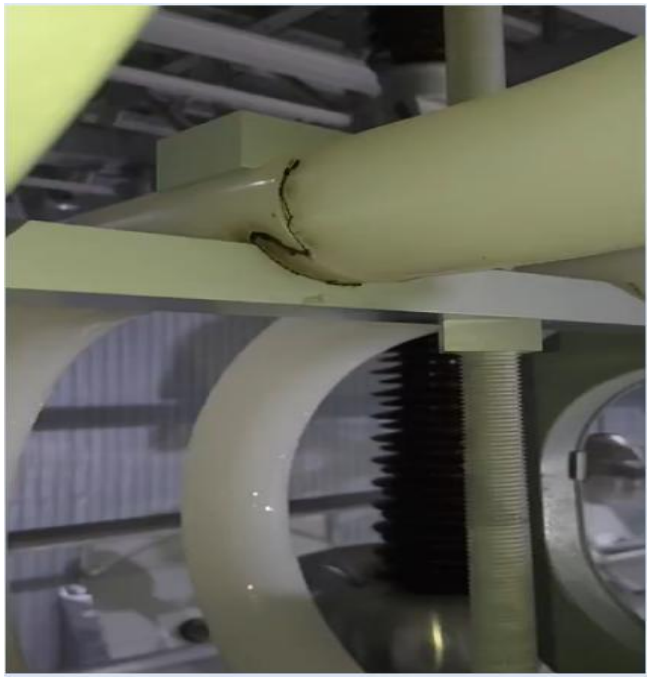


From the PMU plot, tripping of the pole 3 can be observed.

Deliberations:

1. PGCIL SR-II informed that on 14.09.2026 at 17:56:15 hrs, Emergency Stop of HVDC Pole-3 was initiated by the Pole Control system at Pugalur following detection of a Valve Control Unit (VCU) fault by thyristor monitoring of U4 (R-phase, Delta-side valve module).
2. PGCIL SR-II informed that Pole-3 was blocked at the Pugalur end only. The entire power transfer of about 1000 MW was redistributed among the other three poles and no power loss was observed. All poles remained in service at the Raigarh end.
3. PGCIL SR-II further informed that VCU-related alarms had appeared in the SOE from around 17:44 hrs for the U4 valve module. Subsequent analysis indicated that multiple thyristor levels had become faulty/non-communicating with the VCU, resulting in loss of redundancy and consequent tripping of Pole-3.
4. During detailed inspection, water leakage was observed from a punctured PEX pipe of the valve cooling system connecting the main header to the valve module. The puncture was identified at the third S-bend from the top tier.
5. PGCIL SR-II informed that the inlet and outlet PEX pipes were replaced with spare pipes. Cleaning and drying of the thyristors in the affected valve module were carried out, followed by thyristor-level testing of all thyristors in the double valve.
6. After completion of the rectification and testing works, Pole-3 was restored at 04:22 hrs on 16.09.2026.
7. The Forum observed that leakage from the valve cooling PEX pipe had resulted in abnormality of the thyristor monitoring/VCU system, leading to blocking of Pole-3.





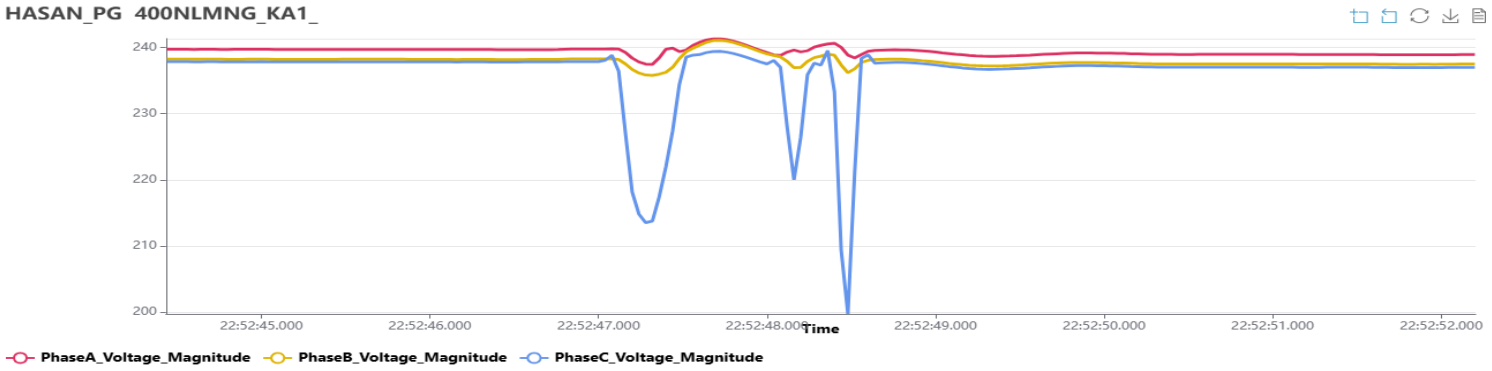
S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
20	400KV-KADANDALE-HEBBANAHALLI-1	As per the reports submitted, the triggering incident was B-G fault in the line. At Kadandale end, the fault was sensed in Z1, B pole got opened and A/R operated successfully but the line tripped on persistent fault. At Hebbanahalli end, the fault was sensed in Z1, B pole got opened and A/R operated successfully but the line tripped on persistent fault.	15-09-2026 22:53	**KPTCL** : 1. Non sensing of fault in KADANDALE Main-2 needs review 2. Variation in sensing of fault in Main-1 (in Z1) and Main-2 (in Z3) at HEBBANAHALLI needs review	**KPTCL** : The line was charged on 18.09.2026 at 00:29 Hrs after snapped conductor rectification work @ location number 261 & 262 and the line stood ok.

	KADANDALE	**HEBBANAHALLI**
FIR	At 400/220kV Hebbanahalli station, 400 kV Hebbanahalli-Kadandale Line-1 tripped on 15.09.2026 at 22:52 Hrs on on DPR , Zone-1, B-Phase to Neutral fault. Both main and tie breakers got tripped at Hebbanahalli end with increment in PLCC counter.	At 400/220kV Kadandale station, 400 kV Hebbanahalli-Kadandale Line-1 tripped on 15.09.2026 at 22:52 Hrs on on DPR , Zone-1, B-Phase to Neutral fault. Both main and tie breakers got tripped at Kadandale end with increment in PLCC counter.
DR	DR Trigger Time:15-09-2026 22:52:47.167 IN>1 Start T1 T1 Z2, Z3 Any Trip, Any Trip C, Z1, DIST Sig. Send, R3 M CB TC-1 BPH, R11 T CB TC-1 BP, R14 21B1 TRIP, R17 CAR SEND CH1, R18 CAR SEND CH2 L3 M CB B OPN, L16 T CB B OPN IN>1 Start DIST. Chan Recv, L10 CAR REC CH1 L8 CAR REC CH2 L18 M/T AR OPTD T1, IN>1 Start I>1 Start Z4 Any Trip, Any Trip A, Any Trip B, Any Trip C, Z1, Z2, Z3, SOTF/TOR Trip, DIST Sig. Send, R7 86A TRIP, R8 86B TRIP, R15 DT SEND CH1, R16 DT SEND CH2, R17 CAR SEND CH1, R18 CAR SEND CH2 L4 86A OPTD L3 M CB B OPN L15 T CB Y OPN	DR Trigger Time:15-09-2026 22:52:48.155 BRC START CB CLOSE COMMAND AR_OPERATED, M/TIE AR OPTD PRP 3PH TR TIE ZONE_3_START GENERAL_TRIP, ZONE_2_START, AR_BLOCK, 3_PH__LBB_INITIA, TIE PTRC TRIP, TIE PTRC TRL1, TIE PTRC TRL2, TIE PTRC TRL3, TIE PTRC TR3P, AR BLOCK, ZCVPSOF[1]_TRIP TRIP_B_PH, SOTF_TRIP, FAULT LOOP B ZONE_1_TRIP, ZONE_1_START, CARRIER_SEND, AR_START, AR START 86B OPTD 86A OPTD 3_PH_TRIP M2 PRT RL OPT MAIN_CB_YPH_OPEN, TIE_CB_BPH_OPEN, MN CB YPH OPEN, TIE CB B-PH OPEN MAIN_CB_RPH_OPE, TIE_CB_YPH_OPEN, MN CB RPH OPEN, TIE CB Y-PH OPEN TIE_CB_RPH_OPEN, TIE CB R-PH OPEN M2 CARR RCVD CARR RECV CH2 CARRIER_RECEIVE

	L14 T CB R OPN L1 M CB R OPN, L2 M CB Y OPN	DT RECEIVED CH-1 GENERAL_TRIP, 3_PH__LBB_INITIA, DT_REC_CH-1/2, TIE PTRC TRIP, TIE PTRC TRL1, TIE PTRC TRL2, TIE PTRC TRL3, TIE PTRC TR3P DR Trigger Time:15-09-2026 22:52:47.423 EF START, EF STFW CARR RCV CH1, CARR RECV CH2 CARRIER_RECEIVE ZONE_2_START, ZONE_3_START GENERAL_TRIP, ZCOM_TRIP, AR_START, TIE PTRC TRIP, TIE PTRC TRL3, AR START M2 PRT RL OPT TRIP_B_PH, FAULT LOOP B 1_PH_LBB_INITIAT TIE_CB_BPH_OPEN, TIE CB B-PH OPEN MAIN_CB_BPH_OPEN, MN CB BPH OPEN EF STRV PSB_INSIDE_ZONE, PSB_OUTSIDE_ZONE EF START TRIP_R_PH, TRIP_Y_PH, FAULT LOOP R, FAULT LOOP Y AR_BLOCK, AR BLOCK EF STRV, BRC START EF START, EF STFW BRC START CB CLOSE COMMAND AR_OPERATED, M/TIE AR OPTD PRP 3PH TR TIE ZONE_3_START GENERAL_TRIP, ZONE_2_START, AR_BLOCK, 3_PH__LBB_INITIA, TIE PTRC TRIP, TIE PTRC TRL1, TIE PTRC TRL2, TIE PTRC TRL3, TIE PTRC TR3P, AR BLOCK, ZCVPSOF[1]_TRIP

		TRIP_B_PH, SOTF_TRIP, FAULT LOOP B ZONE_1_TRIP, ZONE_1_START, CARRIER_SEND, AR_START, AR START 86B OPTD 86A OPTD 3_PH_TRIP M2 PRT RL OPT MAIN_CB_YPH_OPEN, TIE_CB_BPH_OPEN, MN CB YPH OPEN, TIE CB B-PH OPEN MAIN_CB_RPH_OPE, TIE_CB_YPH_OPEN, MN CB RPH OPEN, TIE CB Y-PH OPEN TIE_CB_RPH_OPEN, TIE CB R-PH OPEN M2 CARR RCVD CARR RECV CH2 CARRIER_RECEIVE DT RECEIVED CH-1 GENERAL_TRIP, 3_PH__LBB_INITIA, DT_REC_CH-1/2, TIE PTRC TRIP, TIE PTRC TRL1, TIE PTRC TRL2, TIE PTRC TRL3, TIE PTRC TR3P
EL	Same as DR	Same as DR
TR	Same as FIR	NA

PMU Analysis:



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

Deliberations:

1. KPTCL informed that on 15.09.2026 at 22:53 hrs, 400 kV Kadandale–Hebbanahalli Line-1 tripped due to a B-G fault caused by conductor snapping between Location Nos. 261 and 262.
2. At the Kadandale end, the fault was detected in Zone-1 and B-pole tripped. Auto-Reclosure (A/R) operated; however, as the fault persisted, three-phase tripping occurred. The recorded fault current was about 4.9 kA and the fault location indicated by Main-1 relay was approximately 41.35 km.
3. KPTCL informed that Main-1 and Main-2 relays operated at the Kadandale end; however, the fault distance/Zone-1 indication in Main-2 relay was not available and the same would be verified.
4. At the Hebbanahalli end, Main-1 and Main-2 relays detected the B-G fault in Zone-1. B-pole tripped and A/R was attempted; however, the line subsequently tripped in three phases due to the persistent fault.
5. KPTCL informed that the overall protection operation of the line was found to be in order, except for the issue pertaining to non-pick up of Zone-1 in the Main-2 relay at the Kadandale end 400KV Kadandale-Hebbanahalli-1 in , which would be further verified.
6. SRPC advised KPTCL to review the Main-2 relay operation at the Kadandale end and ascertain the reason for non-Pickup of the Zone-1/fault-distance indication in 400KV Kadandale-Hebbanahalli-1.

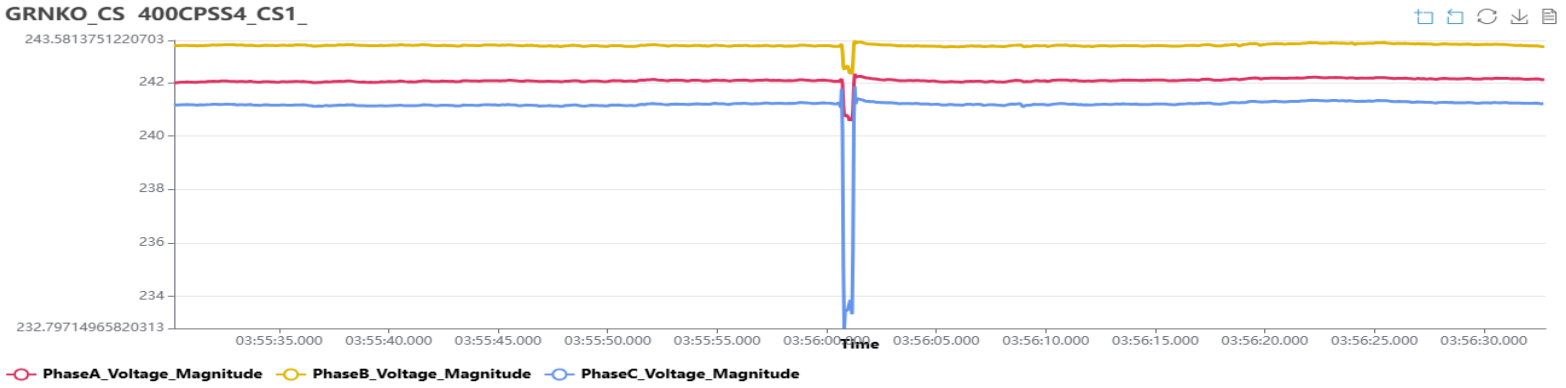
Recommendations;

- KPTCL to review the Main-2 relay operation at the Kadandale end and ascertain the reason for non-Pickup of the Zone-1/fault-distance indication in 400KV Kadandale-Hebbanahalli-1.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
21	400KV/33KV GREENKO_PSS3-ICT-1	As per the reports submitted, the triggering incident was a B-G fault in the 33 kV side Bay. As the fault didn't clear at 33 kV side, earth fault protection of ICT got triggered and tripped the transformer.	16-09-2026 03:58	**GREENKO**: 1. Current coordination at 400KV/33KV GREENKO_PSS3 where in tripping of ICT for 33kV fault needs review	

	GREENKO_PSS3-ICT-1
FIR	315MVA Power Transformer-1 400/33KV Bay-401 CB got tripped on Earth fault at 03:58hrs on dt.16.09.2026 (Due to 33kv end Bay-307 Incomer cable punctured) at PSS-3 nagaluti solar
DR	DR Trigger Time:15-09-2026 22:26:00.757 EF1 START OC1 B START 86-1 OPT CB OPEN
EL	-
TR	Same as FIR

PMU Analysis:



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

Deliberations:

SRPC advised GREENKO to submit a detailed report on the tripping of 400/33 kV GREENKO PSS-3 ICT on 16.09.2026, including the sequence of events, protection operation, relay settings and DR/Event Logger records. SRPC further advised GREENKO to review the protection coordination at 400/33 kV GREENKO PSS-3, particularly the tripping of the ICT for a fault on the 33 kV side.

Recommendations;

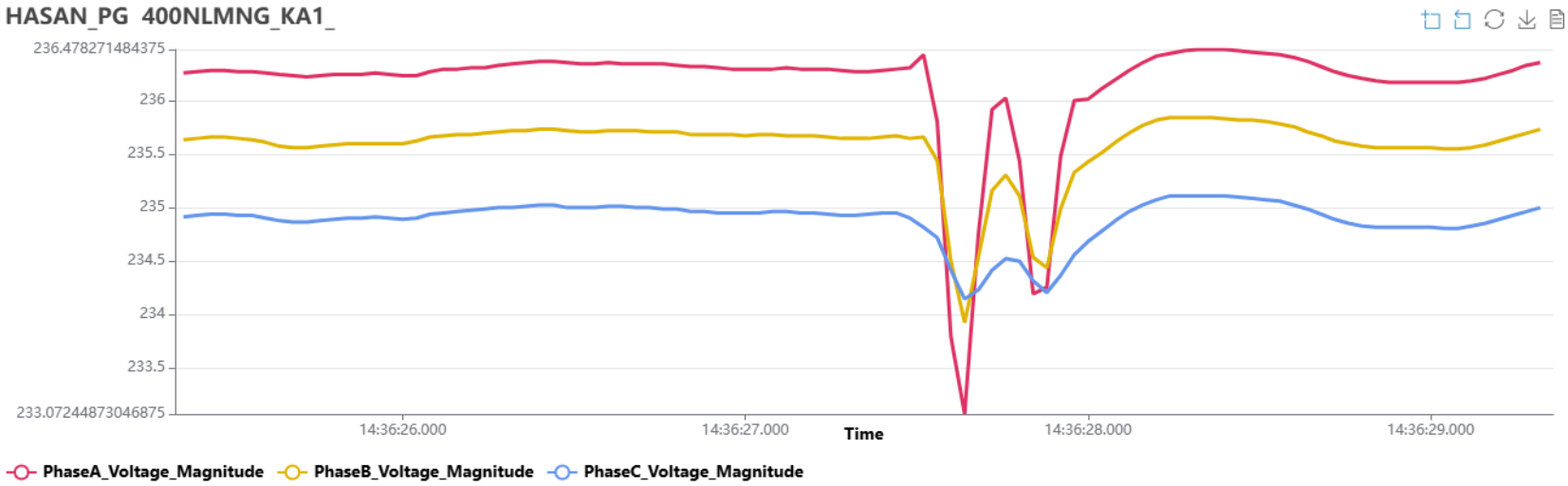
- GREENKO to submit a detailed report on the tripping of 400/33 kV GREENKO PSS-3 ICT on 16.09.2026, including the sequence of events, protection operation, relay settings and DR/Event Logger records.
- GREENKO to review the protection coordination at 400/33 kV GREENKO PSS-3, particularly the tripping of the ICT for a fault on the 33 kV side.
- Greenko to review the DR time synchronization at 400KV/33KV GREENKO_PSS3

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
22	400KV/220KV KADANDALE-ICT-2	As per the reports submitted, the 400 kV/220 kV Kadandale ICT-2 tripped due to REF protection operation during a through fault attributed to a CT polarity issue.	16-09-2026 14:36	**KPTCL** : 1. REF protection tripping during through fault needs review.	**KPTCL** : It was found that, there was change in polarity connection and as per the instruction of RT wing the same has been rectified.

	KADANDALE-ICT-2
FIR	ICT-2 Tripped in REFR Relay. It was found that, there was change in polarity connection.
DR	DR Trigger Time:16-09-2026 14:36:27.635 DEFLPDEF1 START

	DEFLPDEF1 TRIP GR-A INTERTRIP OPTD DR Trigger Time:16-09-2026 14:36:27.635 DEFLPDEF1 START DEFLPDEF1 TRIP GR-A INTERTRIP OPTD
EL	Same as DR
TR	Same as FIR

PMU Analysis:



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

Deliberations:

1. KPTCL informed that on 16.09.2026 at 14:36:27 hrs, 500 MVA ICT-2 at 400 kV Kadandale SS tripped on operation of REF protection during a through-fault condition. The neutral current recorded was approximately 322.42 A.
2. KPTCL informed that ICT-1 remained stable during the same through fault and only ICT-2 tripped on REF protection.
3. KPTCL further informed that the polarity of the neutral bushing CT of ICT-2 was subsequently restored as per the as-built scheme, and ICT-2 was normalised at 15:50 hrs on the same day.

4. KPTCL informed that the matter has been taken up with the OEM, M/s T&R, for detailed examination and necessary corrective action to prevent recurrence of such incidents.

5. SRPC advised KPTCL to carry out a detailed review in consultation with the OEM, physically verify CT polarity and REF stability for both ICTs.

Recommendations:

- KPTCL to carry out a detailed review in consultation with the OEM, physically verify CT polarity and REF stability for both ICTs.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
23	Tripping of 400KV/220KV GAZUWAKA-ICT-3 during fault in 220KV-VIZAG_SWS-PARAVADA-2	As per the reports submitted, the triggering incident was the R-G fault in the 220 kV Vizag_SWS-Paravada-2 line. At both end the fault was sensed in Zone1 and R pole got open; however, A/R successfully operated. During the fault, LBB initiated due to external LBB high from VSS end and further LBB protection operated and tripped the ICT-3.	17-09-2026 15:02	**APTRANSCO** : 1. Sending of spurious signal for LBB initiation and subsequent tripping of ICT-3 due to LBB operation needs review.	

220KV-VIZAG_SWS-PARAVADA-2

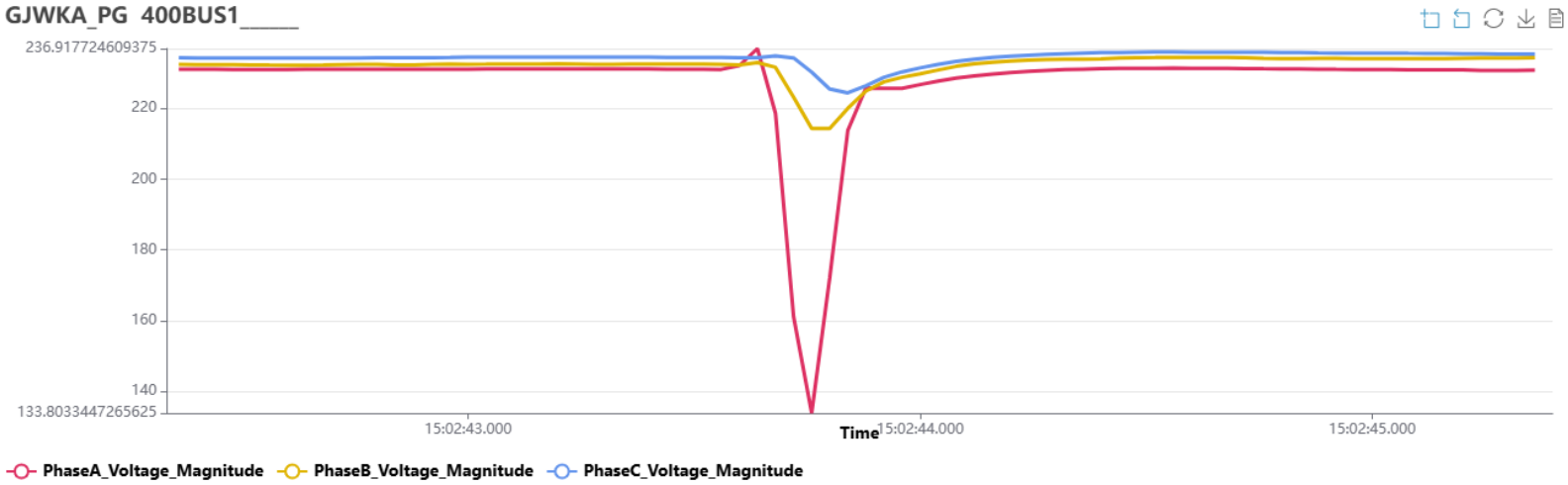
	VIZAG_SWS	PARAVADA
FIR	Feeder was not tripped, Auto reclosure operated and success. Suspected due to lightning on top phase (R-ph) and the weather at that time was Heavy rain with Thunderstorms and lightning	NA
DR	DR Trigger Time:17-09-2026 15:02:43.722 TEF1-STFW, TEF1-2NDHARMD PHS-STFWL1, PHS-STFWPE, PHS START CB_TRP1-TRL1, ZM01-TRIP, ZM01-START, ZM02-START, ZM03-START, ZM04-START,	DR Trigger Time:17-09-2026 15:02:43.794 TEF1-STFW, TEF1-2NDHARMD PHS-STFWL1, PHS-STFWPE, PHS START ZM04-START ZM03-START

	CAR SEND AR-START, BusAR INPROGR, AR START CAR REC CH1 BRC START TEF1-STFW, TEF1-2NDHARMD PHS-STFWL2, PHS-STFWPE TEF1-STRV AR-PREP3P AR CLOSE CB TEF1-2NDHARMD	ZM02-START BI_ZCOM-CR BI EXT TRIPL1 BRC START TRIP L1, ZM01-TRIP, ZM01-START AR INPROGR ZCOM-TRIP CB_RPH_OPEN TEF1-START, TEF1-STFW AR PREP3P AR CLOSE BI CB CLOSED TEF1-2NDHARMD
EL	Same as DR	Same as DR
TR	NA	NA

400KV/220KV GAZUWAKA-ICT-3

	GAZUWAKA-ICT-3
FIR	Tripped on 220kV side only upon operation of 220kV Busbar protection at APTRANSCO.
DR	DR Trigger Time:17-09-2026 15:02:43.726 96 TR RLY OPD 96 TR RLY OPD 96 TR RLY OPD CCRBRF_TRRET, LBB_RETRL1, LBB_RETRL2, LBB_RETRL3 203_CB_OPEN
EL	852 CB AC SUPPLY BUS BAR PROTECTION - OPERATED LV LBB RE TRIP – OPERATED 220KV CIRCUIT BREAKER STATUS - OPEN
TR	Same as FIR

PMU Analysis:



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

Deliberations:

1. APTRANSCO informed that the triggering incident was an R-G fault on 220 kV Vizag SWS–Paravada Line-2. At both ends, the fault was detected in Zone-1 and R-pole tripping occurred. Auto-Reclosure (A/R) operated successfully.
2. APTRANSCO further informed that during the fault, LBB was initiated due to receipt of External LBB High signal from the VSS end. Subsequently, LBB re-trip protection operated, resulting in tripping of ICT-3.
3. APTRANSCO informed that the interconnecting cable between the 96 relay at 220 kV VSS and the LBB relay at the PGCIL end is proposed to be replaced.
4. SRPC advised APTRANSCO to replace the suspected interconnecting cable of 96 relay at 220kV VSS and LBB relay at PGCIL end at the earliest, and ensure proper operation of the LBB scheme to avoid recurrence of such unwarranted tripping.

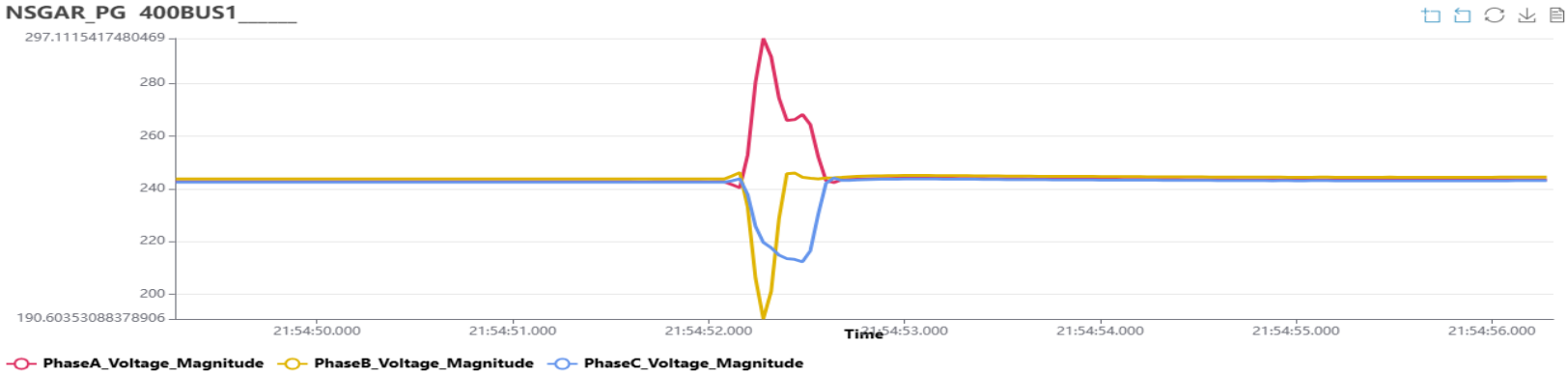
Recommendations:

- APTRANSCO to replace the suspected interconnecting cable of 96 relay at 220kV VSS and LBB relay at PGCIL end at the earliest, and ensure proper operation of the LBB scheme to avoid recurrence of such unwarranted tripping.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
24	400KV/220KV NAGARJUNASAGAR_PG-ICT-3	As per the reports submitted, 400KV/220KV NAGARJUNASAGAR ICT 3 got tripped on 220kV side downstream fault due to Earth fault protection.	18-09-2026 21:54	**PGCIL SR-1** : 1. Tripping of the ICT-3 on EF high set during through fault needs review 2. Current in the ICT DR is observed to be zero and the yet EF St-2 operated and needs review	

	NAGARJUNASAGAR_PG-ICT-3
FIR	Tripped on 220kV side downstream fault, ICT-3 IV EF stage-2 operated.
DR	DR Trigger Time:18-09-2026 21:54:52.249 IV_EF_STG-2, TO_3PH_GR_A_OPTD, TO_3PH_GR_B_OPTD, KIT FEED BACK, IV EF OPD TO NTAMC T_TCB_OPEN M_MCB_OPEN 203_CB_OPEN
EL	-
TR	Same as FIR

PMU Analysis:



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

Deliberations:

1. PGCIL SR-I informed that on 18.09.2026 at 19:17:14 hrs, ICT-1 and ICT-2 at Nagarjunasagar SS tripped consequent to operation of 220 kV Busbar Protection at APTRANSCO Tallapalli Substation.
2. PGCIL SR-I further informed that subsequently, at 21:54:52 hrs, a downstream fault resulted in a current of approximately 9 kA being fed through ICT-3. Consequently, the 220 kV side Earth Fault Stage-2 protection of ICT-3 operated with a time delay of 50 ms, resulting in tripping of ICT-3.
3. SRPC advised PGCIL SR-I to review the Earth Fault Stage-2 settings and coordination of ICT-3 with the downstream 220 kV protection.

Recommendations:

- PGCIL SR-I to review the Earth Fault Stage-2 settings and coordination of ICT-3 with the downstream 220 kV protection.

IV. Non-operation of Auto recloses during transient fault

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
1	220KV-ASUPAKA-LOWER_SILERU-1	As per the reports submitted, the triggering incident was B-G fault in the line. At Asupaka end, the fault was sensed in Z1 and line tripped in all three phases without any A/R operation. At Lower Sileru end, the fault was sensed in carrier aided Z2, B pole got opened and A/R operated successfully and the line was holding.	02-09-2026 12:27	**TGTRANSCO** : 1. Non operation of AR at Asupaka needs review	**TGTRANSCO** : Replacement of main-I D60 relay with ABB make REL670 type relay will be done by availing LC.

TGTRANSCO Vide Mail dated 01.10.2026 has furnished the following information

- Tripped on B-Phase to Ground, Zone-1 indications at Asupaka end.

Remedial Actions taken:

- Replacement of suspected Main-1 D60 relay with REL670 relay will be done by availing LC.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
2	400KV-KALPAKKA-ASUPAKA-1	As per the reports submitted, the triggering incident was R-G fault in the line. At Kalpakka end, the fault was sensed in Z1 and R pole got opened, at Asupaka end, the fault was sensed in Z1 and 3 phase tripping was observed. At Kalpakka end, A/R successfully operated and the line was holding but at Asupaka end A/R didn't operate and 3 phase trip.	08-09-2026 10:25	**TGTRANSCO** : 1. Non operation of AR at Asupaka needs review	

TGTRANSCO Vide Mail dated 01.10.2026 has furnished the following information

- Tripped on R-Phase to Ground, Zone-1 indications at Asupaka end.
- A/R not operated at Asupaka end on 08-09-2026 at 10:25Hrs and on 18-09-2026 at 11:41Hrs respectively.

Remedial Actions taken:

- Non operation of AR will be checked by availing LC.
- Observed AR successful operation for R-N fault on 08-09-2026 at 12:30Hrs.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
3	400KV-GUDDIGUDEM-HINDUJA-1	As per the reports submitted, the triggering incident was Y-G fault in the line. At Guddigudem end, the fault was sensed in Z1 and R pole got opened. At Hinduja end the fault was sensed in Z1 and 3 phase tripped. At Guddigudem end A/R successfully operated and the line was holding but at Hinduja end A/R didn't operate and 3 phase tripped.	08-09-2026 13:25	**HINDUJA** : 1. Non operation of AR at Hinduja end needs review	**HINDUJA** : Investigation is in process

Recommendations:

- Hinduja to review the Non operation of AR at Hinduja end in 400KV-Guddigudem-Hinduja-1.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
4	220KV-ASUPAKA-LOWER_SILERU-1	As per the reports submitted, the triggering incident was a Y-G fault in the line. At Asupaka end, the fault was sensed in Zone 1 and Y pole got opened and Lower Sileru end the fault was sensed in Zone 1 and 3 phase tripping was observed. At Asupaka end A/R successfully operated and the line was holding but at Lower Sileru end A/R didn't operate and 3 phase tripped.	09-09-2026 10:11	**APGENCO** : 1. Non operation of AR at LOWER_SILERU end needs review	

Recommendations:

- APGENCO to review the Non operation of AR at LOWER_SILERU end in 220KV-ASUPAKA-LOWER_SILERU-1

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
5	400KV-MARADAM-KALPAKKA-2	As per the reports submitted, the triggering incident was Y-G fault in the line. At Maradam end, the fault was sensed in Z1 and A/R operated successfully. At Kalpakka end, the fault was sensed in Z1 and A/R did not operate and line tripped in all three phases after 400 ms of Y pole opening.	10-09-2026 15:19	**APTRANSCO** : 1. Non operation of AR at KALPAKKA needs review	

APTRANSCO Vide Mail dated 05.10.2026 has furnished the following information

DETAILS OF EVENT

- The triggering incident was Y-G fault in the line. At Maradam end, the fault was sensed in Z1 and A/R operated successfully. At Kalapaka end, the fault was sensed in Z1 and A/R did not operate and line tripped in all three phases after 500 mS of Y pole opening.

REMEDIAL ACTION TAKEN/ REMARKS

- It was observed that, due to problem with the PD relay timer, 3 ph trip operated after 500mSec.The same was rectified on 11/09/2026 by replacing timer with healthy one and tested and found PD relay operating for 1.5 sec.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
6	400KV-RAMADUGU-SINGARENI-2	As per the reports submitted the triggering incident was a R-G fault in the line. At Ramadugu end the fault was sensed in Zone 2 and R pole got opened, at Singareni end fault was sensed Z1 and R pole got opened and AR operated and the line was holding. At Ramadugu end A/R operated and Main breaker tripped without during AR close without any fault and tie breaker tripped at 2.8 sec from first fault pole discrepancy operated and tripped all three phases of tie breaker at Ramadugu end.	10-09-2026 15:19	**TGTRANSCO** : 1. Tripping of main breaker for 400KV-RAMADUGU-SINGARENI-2 at RAMADUGU after AR operation without any fault needs review 2. Tripping of tie breaker for 400KV-RAMADUGU-SINGARENI-2 at RAMADUGU on PD needs review	

TGTRANSCO Vide Mail dated 01.10.2026 has furnished the following information

- Tripped on R-Phase to Ground, Z-Com indications at Ramadugu end. A/R operated and tripped immediately on Pole discrepancy

Remedial Actions taken:

- Suspected PD timer of Main Breaker is increased temporarily.
- A/R function testing will be checked by availing LC or taking emergency LC.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
7	400KV-KAIGA-GUTTUR-1	As per the reports submitted, the triggering incident was a Y-G fault on the line. At Guttur end, the fault was sensed in Zone 1, and the Y-pole opened. However, after 650 ms, the other two poles also opened due to A/R lockout. At Kaiga end, the fault was sensed in Zone 1, and the Y-pole opened. A/R operated successfully; however, the line subsequently tripped in all three phases due to a persistent fault.	10-09-2026 21:17	**KPTCL** : 1. Non operation of AR at Guttur end needs review	**KPTCL** : The relay has been tested for single ph faults and AR operation. 3 Ph trip initiation in this case is under investigation

KPTCL Vide Mail dated 03.10.2026 has furnished the following information

- 400 KV Guttur- Kaiga line-1 tripped sensing B-N fault in zone 1, fault current 10.39 kA was recorded in B phasae and location of the fault indicated by the relay was 13.40 km.

Details of the relays operated are as follows:

- **Guttur end:** M1,M2, Y-N fault in zone 1, fault current 10.39 kA ,fault location 13.4km;
- **Kaiga end:** M1,M2, Y-N fault in Zone-1 , fault current 3.04 kA, fault location 146.1 km, Trip on Reclosure due to persistent fault.
- **Nature of fault :** Insulator flashover at location no 44 & 45

Remedial Action taken details:

- The line fault was attended.
- AR was blocked by Main-2 (D60) relay during the incident.
- AR operation in the relay was tested recently and found OK .But during fault, AR block becomes high. Hence The relay will be tested once again by taking on line support of the OEM.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
8	400KV-NTPL-TUTICORIN_PS-2	As per the reports submitted, the triggering incident was an R-G fault on the line. At NTPL end, the fault was sensed in Zone 1; however, A/R did not operate, and the line tripped due to pole discrepancy before the AR close command. At Tuticorin end, the fault was sensed in Zone 1, and the R-pole opened. A/R subsequently operated and was successful and the line was holding.	13-09-2026 21:48	**NTPL** : 1. Non operation of AR and tripping of the line on PD needs review. 2. PD operation before the AR close command needs review	**NTPL** : AR dead time being a generating station was kept at 1.25s as per protection audit . The PD settings rechecked dial is found at 1.5s. AR dead time will be reviewed.

Recommendations:

- NTPL to review the Non operation of AR at NTPL end in 400KV-NTPL-TUTICORIN_PS-2.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
9	400KV-NELLORE_AP-VTPS_IV-1	As per the reports submitted, the triggering incident was a Y-G fault in the line. At Nellore end, the fault was sensed in Z1 and Y pole got open, at VTPS_IV end the fault was sensed in Z1 and 3 phase tripping was observed without any A/R operation; however, at Nellore end A/R successfully operated.	14-09-2026 14:04	**APGENCO** : 1. Non operation of AR at VTPS_IV end needs review	

Recommendations:

- APGENCO to review the Non operation of AR at VTPS_IV end in 400KV-NELLORE_AP-VTPS_IV-1.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
10	400KV-NELLORE_AP-VTPS_IV-1	As per the reports submitted, the triggering incident was a B-G fault in the line. At Nellore end, the fault was sensed in Z1 and B pole got open, at VTPS_IV end the fault was sensed in Z1 and 3 phase tripping was observed without any A/R operation; however, at Nellore end A/R successfully operated.	14-09-2026 14:39	**APGENCO** : 1. Non operation of AR at VTPS_IV end needs review	**APGENCO** : Parameter setting of "AR-BlockByUnsucCl kept OFF " and found normal. Now AR ready for next trip.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
11	220KV-NP_KUNTA-SBENERGY_NPK-1	As per the reports submitted, the triggering incident was B-G fault in the line. At SBENERGY_NPK-1 end, the fault was sensed in line differential protection and 3 phase tripping was observed. At NP_KUNTA end the fault was sensed in line differential protection, B pole got opened and after successful A/R operation three phase tripping also observed due to fault in reclaim time.	17-09-2026 13:12	**APSPCL** : 1. Non operation of AR at SBENERGY_NPK end during single phase fault needs review.	**PGCIL SR-1** : Line patrolling was conducted from Npkunta PSS-4 (SB Energy) to the 400kV PGCIL end, but no fault was found

PGCIL SR-1 Vide Mail dated 03.10.2026 has furnished the following information

- The line got auto reclosed successfully on B-G fault at NPKunta end, AR Failed at remote end.
- Line belongs to RE developer.
- The protection operation is in order at NPKunta end.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
12	400KV-KALPAKKA-ASUPAKA-1	As per the reports submitted, the triggering incident was R-G fault in the line. At Kalpakka end, the fault was sensed in Z1 and R pole got open; however, A/R also successfully operated. At Asupaka end, the fault was sensed in Z1 and the line 3 ph tripped without any A/R operation.	18-09-2026 11:41	**TGTRANSCO** : 1. Non operation of AR at ASUPAKA end needs review	

TGTRANSCO Vide Mail dated 01.10.2026 has furnished the following information

- Tripped on R-Phase to Ground, Zone-1 indications at Asupaka end.
- A/R not operated at Asupaka end on 08-09-2026 at 10:25Hrs and on 18-09-2026 at 11:41Hrs respectively.

Remedial Actions taken:

- Non operation of AR will be checked by availing LC.
- Observed AR successful operation for R-N fault on 08-09-2026 at 12:30Hrs.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
13	400KV-CHITTOOR-KALIKIRI-2	As per the reports submitted, the triggering incident was a B-G fault in the line. At Chittoor end, the B-G fault was sensed in carrier aided Z2 and B pole got open; however, after 480 ms other two poles also got open without any A/R operation. At Kalikiri end, the B-G fault was sensed in Z1 and B pole got open; however, A/R also successful at this end.	20-09-2026 00:58	**APTRANSCO** : 1. Non operation of AR at CHITTOOR end needs review	**APTRANSCO** : Proposed for carrying out Main-2 Relay testing for trouble-shooting within a week.

APTRANSCO Vide Mail dated 05.10.2026 has furnished the following information

DETAILS OF EVENT

- The triggering incident was a B-G fault in the line. At Chittoor end, the B-G fault was sensed in carrier aided Z2 and B pole got open; however, after

480 mS other two poles also got open without any A/R operation. At Kalikiri end, the B-G fault was sensed in Z1 and B pole got open; however, A/R also successful at this end.

REMEDIAL ACTION TAKEN/ REMARKS

- It was observed that during the incident Main-2 relay (7SA522) detected the fault in Zone-1 and tripped B-Ph CB. Even after clearance of fault, the trip command was continued to be persisting and hence subsequently after Zone-2 time delay Zone-2 protection operated and tripped all the 3-phases of CB.
- This will be rectified soon as and when Line clear available.

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
14	400KV-KRISHNAPATNAM-RACHAGUNNERI-1	As per the reports submitted, the triggering incident was Y-G fault in the line. At Krishnapatnam end, the fault was sensed in Z1 and the line 3ph tripped without any A/R operation. At Rachagunneri end, the fault was sensed in Z1 and Y pole got open; however, A/R successfully operated.	20-09-2026 02:06	**APGENCO** : 1. Non operation of AR at KRISHNAPATNAM end needs review	**APGENCO** : The AR function testing proposed at SDSTPS end for all the lines through OEM HITACHI.PO placed ,which will completed during Nov and Dec months.

Recommendations:

- APGENCO to review the Non operation of AR at KRISHNAPATNAM end in 400KV-KRISHNAPATNAM-RACHAGUNNERI-1.

V. PLCC Maloperation-related Events

S. No.	Event	Event Analysis	Outage Date & time	Points for Review	Remedial Actions Furnished
1	400KV-MEDARAM_GIS-RAMADUGU-1	As per the reports submitted, the triggering incident was the DT receipt due to PLCC maloperation at Medaram end and the line tripped only at Medaram end. Line was in service at Ramadugu end.	19-09-2026 00:26	**TGTRANSCO** : 1. PLCC maloperation at Medaram end needs review	

TGTRANSCO Vide Mail dated 01.10.2026 has furnished the following information

- Line is in service at Ramadugu end
- Line tripped on Direct trip received indications at Medaram end only.
- Tripping incident occurred while hand tripping 400kV Ramadugu -Medaram Line-2 as per LD instructions.
- DT signal sent from Ramadugu SS to Medaram SS in both the circuits.

Remedial Actions taken :

- End to End testing of the line and Telecom wiring at Ramadugu end will be checked on 01-10-2026.

VI. DR Time Synchronization Issues Related Events

Sl. No	Element	Date & Time	Station at which DR time synchronisation was not observed
1	220KV-KUDGI_NTPC-BILAGI-1	24-08-2026 06:25	BILAGI - 220KV
	KPTCL to review the DR Time Synchronization at 220kV Bilagi		
2	220KV-THENI-SABARIGIRI-1	24-08-2026 15:37	SABARIGIRI - 220KV
	KSEB to review the DR Time Synchronization at 220kV Sabarigiri		
3	400KV/220KV RAMAGUNDAM-ICT-5	29-08-2026 12:41	RAMAGUNDAM - 400KV
	NTPC RSTPS to review the DR Time Synchronization at 400kV Ramagundam		
4	220KV-RAMAGUNDAM-MALYALAPALLI-4	29-08-2026 12:41	MALYALAPALLI - 220KV

TGTRANSCO Vide Mail dated 01.10.2026 has furnished the following information

- On the day of tripping incident UPS supply connected to GPS switch failed causing loss of GPS time synchronization.
- At time GPS synchronization is done. Rectification of UPS is under progress.

5	400KV-KAIGA-GUTTUR-1	01-09-2026 11:29	GUTTUR - 400KV
	KPTCL to review the DR Time Synchronization at 400kV Guttur		
6	400KV-ALAMATHY-SUNGAVARACHATRAM-2	01-09-2026 13:47	ALAMATHY - 400KV
	TANTRANSCO to review the DR Time Synchronization at 400kV Alamathy		
7	400KV-ALAMATHY-SUNGAVARACHATRAM-2	01-09-2026 13:47	SUNGAVARACHATRAM - 400KV
8	400KV-ALAMATHY-SUNGAVARACHATRAM-2	02-09-2026 15:57	SUNGAVARACHATRAM - 400KV
	TANTRANSCO to review the DR Time Synchronization at 400kV SUNGAVARACHATRAM		
9	400KV-ALAMATHY-TIRUVALAM_TN-2	03-09-2026 06:42	ALAMATHY - 400KV
10	220KV-AMBEWADI-XELDEM-1	04-09-2026 13:03	AMBEWADI - 220KV
	KPTCL to review the DR Time Synchronization at 220kV Ambewadi		
11	400KV-NEYVELI_TS_II-PUGALUR-1	05-09-2026 12:11	NEYVELI_TS_II - 400KV
	NLC TS-II to review the DR Time Synchronization at 400kV NLC TS-II		
12	230KV-NCTPS-SRIPERUMBADUR_TN-1	07-09-2026 23:32	SRIPERUMBADUR_TN - 230KV
	TANTRANSCO to review the DR Time Synchronization at 230kV Sriperumbadur		
13	230KV-NCTPS-KILPAUK-1	07-09-2026 23:21	NCTPS - 230KV
	TNPGCL to review the DR Time Synchronization at 230kV NCTPS		
14	230KV-NCTPS-KILPAUK-1	07-09-2026 23:21	KILPAUK - 230KV
	TANTRANSCO to review the DR Time Synchronization at 230kV Kilapauk		
15	230KV-NCTPS-SRIPERUMBADUR_TN-1	07-09-2026 23:32	NCTPS - 230KV
16	NCTPS - 230KV	07-09-2026 23:32	NCTPS - 230KV
17	400KV-KAIGA-GUTTUR-1	08-09-2026 13:38	GUTTUR - 400KV

18	220KV-AMBEWADI-PONDA-2	10-09-2026 10:48	AMBEWADI - 220KV
19	400KV-PALAVADI-MTPS_ST_III-1	11-09-2026 13:06	MTPS_ST_III - 400KV
	TNPGCL to review the DR Time Synchronization at 400kV MTPS stage-III		
20	SHARAVATHY - 220KV	12-09-2026 01:59	SHARAVATHY - 220KV
	KPCL Vide Mail dated 01.10.2026 has furnished the following information ❖ On 12.09.2026 at 01:59 Hrs Sharavathy Balligavi Line tripped on Bph fault, Z1, I= 18 kA. ❖ Unit#6 Over current protection trip operated; R & B Ph breakers failed to open; LBB operated. ❖ No time Sync issue is observed and time sync is in order.		
21	220KV-AMBEWADI-PONDA-2	12-09-2026 13:01	AMBEWADI - 220KV
22	400KV-MANALI-PULIYANTHOPE-2	14-09-2026 00:47	MANALI - 400KV
	TANTRANSCO to review the DR Time Synchronization at 400kV Manali		
23	HVDC 500KV GAZUWAKA Pole 1	14-09-2026 12:47	GAZUWAKA
	PGCIL SR-1 Vide Mail dated 03.10.2026 has furnished the following information ❖ Pole-1 got blocked at 12:45PM. No time synch issue was observed.		
24	HVDC 500KV GAZUWAKA Pole 2	14-09-2026 12:47	GAZUWAKA
	PGCIL SR-1 Vide Mail dated 03.10.2026 has furnished the following information ❖ Pole-2 got blocked at 12:42PM. No time synch issue was observed.		
25	400KV/33KV GREENKO_PSS3-ICT-1	16-09-2026 03:58	GREENKO_PSS3 - 400KV
	Greenko to review the DR Time Synchronization at GREENKO_PSS3 - 400KV		
26	HVDC500KV-TALCHER-KOLAR_DC-1	17-09-2026 11:28	KOLAR HVDC - 500KV
	PGCIL SR-2 Vide Mail dated 01.10.2026 has furnished the following information ❖ As per SOE Time of operation is correct. Time Synchronisation is checked and found correct.		
27	220KV-NP_KUNTA-SBENERGY_NPK-1	17-09-2026 13:12	NP_KUNTA - 220KV

	PGCIL SR-1 Vide Mail dated 03.10.2026 has furnished the following information ❖ The first fault occurred at 13:16 Hrs. No time synch issue was observed.		
28	220KV-NP_KUNTA-SBENERGY_NPK-1	17-09-2026 13:12	SBENERGY_NPK - 220KV
	APSPCL to review the DR Time Synchronization at SBENERGY_NPK - 220KV		
29	400KV-THENNAMPATTY-VIRUDHUNAGAR-1	20-09-2026 16:17	VIRUDHUNAGAR - 400KV
	TANTRANSCO to review the DR Time Synchronization at 400kV Virudhunagar		