

Details of Grid Events during the Month of March 2023 in Northern Region



Sl No.	Category of Grid Event	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration (H:MM)	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid*		Brief details of the event (pre fault and post fault system conditions)	Elements Tripped
						Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
1	GD-1	Uttar Pradesh	06-Mar-2023 20:47	06-Mar-2023 22:12	01:25	0	96	0.000	0.172	51210	55682	<p>i) 400/220/33kV Noida Sec148 GIS has double main single breaker bus scheme. Power comes from 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) D/C and feeds Noida Sec 123 via 400 KV Noida Sec 148-Noida Sec 123 (UP) D/C and feeders connected at 220kV level at Noida Sec 148. There are 1*160MVA 220/132kV ICT and 1*60MVA 220/33kV transformer.</p> <p>ii) As reported, brief detail of the event are as follows:</p> <p>a) There are two (no.) DC source i.e., I & II with automatic changeover mechanism via mechanical changeover relay which takes approx. minimum 100msec to changeover the DC source.</p> <p>b) There is a logic for initiation of bus bar protection with the delay of 100msec in the case of gas detector stage-3 (GD-3).</p> <p>c) In addition, there is an issue related to arrangements of contacts of DC source that whenever DC source is not available then it raises flag as gas detector stage-3 (GD-3) which further initiates bus bar tripping as DC source changeover takes more than 100msec.</p> <p>d) There is also a preexisting issue related to cards of battery charger which lead to DC source failure during any fluctuation in AC supply.</p> <p>e) So, at 20:47hrs on 06th Mar23, a RYB three phase fault occurred in one of the 33kV feeder (feeder no 14), differential current was approx. 20kA.</p> <p>f) During this fault, DC supply from DC source-I lost due to issue arise in its battery charger.</p> <p>g) And before DC source changeover could have occurred, bus bar tripping initiated with the flag of GD-3.</p> <p>h) Due to bus bar protection operation, all the feeders and elements connected at both the 400kV bus tripped.</p> <p>i) Similar logic/arrangement w.r.t. DC source & GD-3 and bus bar tripping initiation is implemented at 220kV level. However, as bus bar relay at 220kV side is defective that's why tripping didn't initiate to elements connected at 220kV bus although, 1*160MVA 220/132kV ICT tripped, reason of the same is yet to be identified.</p> <p>ii) As per PMU at 765kV Agral(PG), voltage dip of approx. 02kV is observed in all the three phases which suspects RYB fault in downward network.</p> <p>iv) As per SCADA, change in demand of approx. 96MW is observed in UP control area.</p>	<p>1) 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1</p> <p>2) 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-2</p> <p>3) 400KV Bus 1 at Noida Sec 148(UP)</p> <p>4) 400KV Bus 2 at Noida Sec 148(UP)</p> <p>5) 400/220 kv 500 MVA ICT 1 at Noida Sec 148(UP)</p> <p>6) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1</p> <p>7) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-2</p>
2	GD-1	Uttar Pradesh	08-Mar-2023 17:26	08-Mar-2023 18:13	00:47	0	80	0.000	0.208	35619	38477	<p>i) 400/220/33kV Noida Sec148 GIS has double main single breaker bus scheme. Power comes from 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) D/C and feeds Noida Sec 123 via 400 KV Noida Sec 148-Noida Sec 123 (UP) D/C and feeders connected at 220kV level at Noida Sec 148. There are 2*500MVA ICT at Noida Sec148, during antecedent condition, only I, was in service. There is 1*160MVA 220/132kV ICT and 2*100MVA 220/33kV transformer.</p> <p>ii) As reported, brief detail of the event are as follows:</p> <p>a) At 17:26hrs, flashover occurred at Y-phase of earth switch of 402 Bay (400KV Noida Sec148- Noida sec 123 ckt-2) at Noida sec 148 end. Noida Sec123 ckt-2 was connected at 400KV Bus-2 at Noida Sec148.</p> <p>b) On this fault, Bus bar protection operated. However, due to delayed opening of bus coupler bay, elements connected to 400kV bus-1 also tripped.</p> <p>c) Operation of bus bar protection has been tested and it is found okay.</p> <p>d) Reason of delayed opening of bus coupler breaker not identified yet.</p> <p>iii) As per PMU at 765kV Agral(PG), Y-N phase to earth fault which cleared within 100msec is observed.</p> <p>iv) As reported by SLDC-UP, load loss of approx. 80MW occurred in UP control area.</p>	<p>1) 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1</p> <p>2) 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-2</p> <p>3) 400KV Bus 1 at Noida Sec 148(UP)</p> <p>4) 400KV Bus 2 at Noida Sec 148(UP)</p> <p>5) 400/220 kv 500 MVA ICT 1 at Noida Sec 148(UP)</p> <p>6) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1</p> <p>7) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-2</p>
3	GD-1	Uttar Pradesh	09-Mar-2023 14:59	09-Mar-2023 15:19	00:20	0	100	0.000	0.205	46921	48706	<p>i) 400/220/33kV Noida Sec148 GIS has double main single breaker bus scheme. Power comes from 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) D/C and feeds Noida Sec 123 via 400 KV Noida Sec 148-Noida Sec 123 (UP) D/C and feeders connected at 220kV level at Noida Sec 148. There are 2*500MVA ICT at Noida Sec148, during antecedent condition, only ICT-1 was in service. There is 1*160MVA 220/132kV ICT and 2*100MVA 220/33kV transformer.</p> <p>ii) As reported, brief detail of the event are as follows:</p> <p>a) There are two (no.) DC source i.e., I & II with automatic changeover mechanism via mechanical changeover relay which takes more than 100msec to changeover the DC source.</p> <p>b) There is a logic for initiation of bus bar protection with the delay of 100msec in the case of gas detector stage-3 (GD-3).</p> <p>c) In addition, there is an issue related to arrangements of contacts of DC source that whenever DC source is not available then it raises flag as gas detector stage-3 (GD-3) which further initiates bus bar tripping as DC source changeover takes more than 100msec.</p> <p>d) There is also a preexisting issue related to cards of battery charger which lead to DC source failure during any fluctuation in AC supply.</p> <p>e) So, at 14:59hrs on 09th Mar23, a RYB three phase fault occurred in one of the 33kV feeder (feeder no 12), differential current was approx. 20kA.</p> <p>f) During this fault, DC supply from DC source-I lost due to issue arise in its battery charger.</p> <p>g) And before DC source changeover could have occurred, bus bar tripping initiated with the flag of GD-3.</p> <p>h) Due to bus bar protection operation, all the feeders and elements connected at both the 400kV bus tripped.</p> <p>i) Similar logic/arrangement w.r.t. DC source & GD-3 and bus bar tripping initiation is implemented at 220kV level. However, as bus bar relay at 220kV side is defective that's why tripping didn't initiate to elements connected at 220kV bus although, 1*160MVA 220/132kV ICT tripped, reason of the same is yet to be identified.</p> <p>ii) It is informed that, defective cards in battery charger has been replaced. Both the DC source are healthy now, same has been tested and confirmed.</p> <p>iii) Issue related to logic of bus bar protection is yet to be resolved, follow up has been taken to resolve the same.</p> <p>iv) As per PMU at 400kV Agral(PG), voltage dip of approx. 03kV is observed in all the three phases which suspects RYB fault in downward network.</p> <p>v) As reported by SLDC-UP, load loss of approx. 100MW occurred in UP control area.</p>	<p>1) 400 KV Gr.Noida_2(UPC)-Noida Sec 148 (UP) Ckt-1</p> <p>2) 400KV Bus 1 at Noida Sec 148(UP)</p> <p>3) 400/220 kv 500 MVA ICT 1 at Noida Sec 148(UP)</p> <p>4) 400 KV Noida Sec 148-Noida Sec 123 (UP) Ckt-1</p>
4	Gi-2	Himachal Pradesh	13-Mar-2023 17:00	13-Mar-2023 22:55	05:55	0	0	0.000	0.000	45807	45410	<p>i) 400kV Koldam(NTPC) S/s has one and half breaker bus scheme. In antecedent condition, there was no generation at Koldam HEP.</p> <p>ii) At 17:00hrs, Y-N phase fault occurred on 400 KV Koldam(NT)-Parbati Pooling Banala(PG) (PKTCL) Ckt-1. On this fault, line took the auto reclosing attempt. As fault was of permanent nature, line tripped but due of some issue in cable, its closing status didn't reset which further led to the operation of LBB protection of main CB of the line.</p> <p>iii) Due to operation of LBB of main CB of 400 KV Koldam(NT)-Parbati Pooling Banala(PG) (PKTCL) Ckt-1, all the Main CBs connected to 400kV bus-1 at Koldam tripped. As the CB of 400 KV Koldam(NT)-Ludhiana(PG) (PKTCL) Ckt-1 was already in out condition, this line tripped with the opening of main CB.</p> <p>iv) As per PMU at 400kV Koldam(NTPC), Y-N phase to earth fault with unsuccessful A/R operation due to permanent fault and multiple reclosing attempt if observed, fault cleared with the delay of 320msec.</p> <p>v) As per SCADA, no load loss is observed in HP control area.</p>	<p>1) 400 KV Koldam(NT)-Parbati Pooling Banala(PG) (PKTCL) Ckt-1</p> <p>2) 400KV Bus 2 at Koldam(NT)</p> <p>3) 400 KV Koldam(NT)-Ludhiana(PG) (PKTCL) Ckt-1</p>
5	Gi-2	Rajasthan	13-Mar-2023 02:05	13-Mar-2023 04:39	02:34	0	0	0.000	0.000	35490	39029	<p>i) 220 kV Kota(PG) has double main transfer bus scheme. During antecedent condition, 400/220 kv 315 MVA ICT 2, 220 KV Bhiwarar(RS)-Kota(PG) Ckt and 220 KV Kota(PG)-KTPS Ckt-2 are connected at 220 kv Bus 2 at Kota(PG).</p> <p>ii) As reported by CPCC NRI, 220 kv Bus Coupler CT of B Phase blasted and bus bar protection operated. Due to this, 220kV Bus 2 at Kota(PG) tripped along with 400/220 kv 315 MVA ICT 2 at Kota(PG) and the feeders connected to Bus 2, i.e., 220 KV Bhiwarar(RS)-Kota(PG) Ckt and 220 KV Kota(PG)-KTPS Ckt-2.</p> <p>iii) As per PMU at 400kV Kota(PG), B-N phase to ground fault is observed with fault clearance time of 80 ms.</p> <p>iv) As per SCADA, no load loss and generation loss is observed in Rajasthan control area.</p>	<p>1) 400/220 kv 315 MVA ICT 2 at Kota(PG)</p> <p>2) 220KV Bus 2 at Kota(PG)</p> <p>3) 220 KV Bhiwarar(RS)-Kota(PG) Ckt</p> <p>4) 220 KV Kota(PG)-KTPS Ckt-2</p>

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Sl No.	Category of Grid Event (GI Ior 2/ GD-1 to GD-5)	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration (HEMM)	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid*		Brief details of the event (pre fault and post fault system conditions)	Elements Tripped
						Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
6	GI-1	Jammu & Kashmir	13-Mar-2023 12:23	13-Mar-2023 12:50	00:27	0	265	0.000	0.497	51197	53330	i) As reported, at 12:23 hrs, 220kV/132kV 150MVA ICT-1 at Pampore tripped due to Buchholz relay operation. ii) With the tripping of ICT-1, 220kV/132kV 150MVA ICT-2 & ICT-3 also tripped on over current protection operation due to overloading. iii) As per PMU, no fault is observed in system. iv) As per SCADA, load loss of approx. 265MW occurred in J&K control area.	1) 220kV/132kV 150MVA ICT-1 at Pampore 2) 220kV/132kV 150MVA ICT-2 at Pampore 3) 220kV/132kV 150MVA ICT-3 at Pampore
7	GI-2	Uttar Pradesh	14-Mar-2023 13:50	14-Mar-2023 15:38	01:48	0	0	0.000	0.000	52681	53954	i) 400 kV Basti(UP) has double main bus scheme. ii) During antecedent condition, 400 kV Tanda(NT)-Basti(UP) Ckt-2, 400 kV Lucknow_1(PG)-Basti(UP) Ckt-1&2, 400 kV Gorakhpur(PG)-Basti(UP) Ckt-2 and 400/220 kV 500 MVA ICT 2 at Basti(UP) are connected to Bus-2 at 400 kV Basti(UP). Remaining elements were connected at Bus-1. Also, 400 kV Gorakhpur(PG)-Basti(UP) Ckt-2 was under planned shut down for relay testing work. iii) As reported, PLCC was not deactivated at both the ends during relay testing. At 13:50hrs, during testing of 400 kV Gorakhpur(PG)-Basti(UP) Ckt-2 at POWERGRID end, DT was received at Basti end. iv) At the same time, LBB protection operated at Basti end which led to the tripping of all the elements connected to Bus-2. v) At the same time, 33 KV Basti(UP)-Munderwa Ckt also tripped, according to SCADA SOE. vi) As per PMU at Lucknow(PG), no fault is observed. However, voltage dip of approx. 1kV is observed in all the three phases. vii) As per SCADA, no load loss occurred in Uttar Pradesh control area.	1) 400 kV Tanda(NT)-Basti(UP) Ckt-2 2) 400 kV Lucknow_1(PG)-Basti(UP) Ckt-1 3) 400 kV Lucknow_1(PG)-Basti(UP) Ckt-2 4) 400/220 kV 500 MVA ICT 2 at Basti(UP)
8	GI-2	Haryana	14-Mar-2023 20:03	14-Mar-2023 21:07	01:04	0	0	0.000	0.000	42062	51187	i) During antecedent condition, all four poles were in service and carrying total 2000MW. ii) As reported, brief of detail of event (attached as Annexure-I) are as follows: a) At 20:03:41hrs, T-zone protection of pole-2 latched at Kurukshetra end which blocked pole-2 and initiated CAT B protection to block parallel pole which further led to the block of pole-4. b) As per event logger, it was found that, T-zone protection operated due to faulty measurement of Pole-4 IdI current. c) During investigation, everything was found healthy. It is suspected that faulty measurement occurred due to stray capacitance. d) A modification has been done by OEM to avoid such type of issue by inserting a 1kohm resistor in series for long signals. iii) After Pole-2 & 4 blocked, power compensated by remaining Poles in service. iv) As per PMU, fluctuation in voltage was observed.	1) 800 kV HVDC Kurukshetra(PG) Pole-02 2) 800 kV HVDC Kurukshetra(PG) Pole-04
9	GI-1	Uttar Pradesh	20-Mar-2023 20:07	20-Mar-2023 23:55	03:48	360	0	1.024	0.000	35143	42145	i) During antecedent condition, testing of 220kV side CT of 220/33kV transformer of Solar(connected at 220k Bus-2) at Unchahar 5/5 was being done. 210MW Unit-2 at Unchahar (carrying ~183MW) was connected at 220kV Bus-2 and 210MW Unit-1 at Unchahar (carrying ~178MW) was connected at 220kV Bus-1. ii) As reported, at 20:07hrs, during testing, bus bar protection of 220kV Bus-2 operated. It led to the tripping of all the elements connected at 220kV Bus-2. Station transformer(for auxiliaries of Unit-1&2) also tripped as it was connected at 220kV Bus-2. iii) With the tripping of station transformer, power supply to auxiliary system of Unit-1 also got lost and cooling water pump for 210MW Unit-1 tripped. iv) After approx. 3min of tripping of Bus-2, 210MW Unit-1 at Unchahar also tripped on low vacuum. v) As per PMU at 765kV Kanpur(PG), no fault in system is observed. vi) As per SCADA, generation loss of approx. 360MW at Unchahar is observed.	1) 220 kV Unchahar(NT)-Raebareilly(PG) (UP) Ckt-2 2) 210 MW Unchahar TPS - UNIT 2 3) 220 kV Unchahar(NT)-Malwan(UP) (UP) Ckt-2 4) 210 MW Unchahar TPS - UNIT 1
10	GI-2	Uttar Pradesh	22-Mar-2023 16:51	22-Mar-2023 19:54	03:03	0	0	0.000	0.000	38301	38596	i) 400 kV Jehta(UP) has double main bus scheme. ii) During antecedent condition, 400 kV Unnao(UP)-Jehta_Hardoi Road (UP) Ckt-2 was under planned shutdown and code issued for charging at 16:27 hrs. iii) As per information received from SLDC UP, at 16:51 hrs while charging 400 kV Unnao(UP)-Jehta_Hardoi Road (UP) Ckt-2, bus bar protection operated at 400 kV Jehta(UP). So, all the elements connected to 400 kV Bus-1 & 2, e.g., 400 kV Unnao(UP)-Jehta_Hardoi Road (UP) Ckt-1, 400 kV Lucknow_1(PG)-Jehta_Hardoi Road (UP) Ckt-1&2, 400/220 kV 500 MVA ICT 1&2 at Jehta_Hardoi Road (UP) got tripped and 400 kV Bus-1 & 2 at Jehta(UP) became dead. DT was received at Lucknow end. iv) Load at Jehta(UP) was managed through 220kV Jehta-Hardoi road ckt.1&2. Hence 220 kV Bus 1& 2 at Jehta(UP) did not trip and substation did not become dead. v) As per PMU at Lucknow(PG), Y-N phase to ground fault with fault clearance time of 80 msec is observed. vi) As per SCADA, no load loss occurred in Uttar Pradesh control area.	1) 400 kV Unnao(UP)-Jehta_Hardoi Road (UP) Ckt-1 2) 400/220 kV 500 MVA ICT 1 at Jehta_Hardoi Road (UP) 3) 400/220 kV 500 MVA ICT 2 at Jehta_Hardoi Road (UP) 4) 400 kV Lucknow_1(PG)-Jehta_Hardoi Road (UP) Ckt-1 5) 400 kV Lucknow_1(PG)-Jehta_Hardoi Road (UP) Ckt-2 6) 400 kV Jehta_Hardoi Road (UP) Bus-1 7) 400 kV Jehta_Hardoi Road (UP) Bus-2 8) 63 MVAR Bus reactor at 400kV Jehta_Hardoi Road (UP)

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						Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
11	GI-2	Uttar Pradesh	23-Mar-2023 13:07	23-Mar-2023 14:45	01:38	0	300	0.000	0.733	41319	40915	i) During antecedent condition, 400kV Bus-1 at Kanpur(PG) was under shutdown and 400kV Kanpur-Fatehpur ckt-1&2 were connected at same dia with 400kV Kanpur-Panki ckt-1&2 (line length approx. 6km) (Main CB of Kanpur-Fatehpur ckt was in open condition). ii) As reported, at 13:07hrs, R & Y ph pole of CB of at Panki end of 220kV Panki-Kanpur South ckt damaged. On this fault, bus bar protection at 220kV Panki(UP) operated. iii) As per SCADA, elements connected at both the 220kV bus at Panki(UP) tripped. As fault didn't clear in time, 400/220kV 315MVA ICT-1&2 at Panki(UP) and 400kV Kanpur-Fanki D/C also tripped with delay. iv) As per SOE & PMU data & DR/EL received, sequence of the event is as follows: a) At 13:06:18:680hrs, fault occurred in R-ph which cleared within 100msec. At the same time, line CB at Kanpur South end of 220kV Panki-Kanpur South ckt opened (as per SOE). b) At 13:07:37:360hrs, again fault occurred in R-phase which didn't clear at that moment. At the same time, line CB at Panki end of 220kV Panki-Kanpur South ckt opened (as per SOE). c) At 13:07:39:880hrs, fault occurred in Y-ph also. d) At 13:07:42:760hrs, fault in R & Y phase cleared and fault in R phase started, R phase fault cleared with the delay of 5.4sec and Y phase fault cleared with the delay of 2.8sec. At the same time, 400/220kV 315MVA ICT-2 at Panki(UP) tripped on directional O/C protection operation at 400kV side (as per SOE & DR). e) At 13:07:45:560hrs, fault in B phase cleared with the delay of 2.8sec. At the same time, 400kV Kanpur-Panki D/C tripped on O/C E/F protection operation at Kanpur end and 400/220kV 315MVA ICT-1 at Panki(UP) tripped on directional O/C protection operation at 400kV side (as per SOE & DR). f) As per fault locator detail of 400kV Kanpur-Panki D/C at Kanpur(PG) end, B phase fault distance was approx. ~200km from Kanpur(PG) end. It shows that fault was at 220kV side of Panki(UP). v) As 400kV Bus-1 at Kanpur(PG) was under shutdown, 400kV Kanpur-Fatehpur D/C tripped with the tripping of 400kV Kanpur-Panki D/C. vi) As per SCADA, load loss of approx. 300MW occurred in Uttar Pradesh control area.	1) 400 KV Kanpur(PG)-Panki(UP) (PG) Ckt-1 2) 400 KV Kanpur(PG)-Panki(UP) (PG) Ckt-2 3) 400/220 KV 315 MVA ICT 1 at Panki(UP) 4) 400/220 KV 315 MVA ICT 2 at Panki(UP) 5) 400 KV Fatehpur-Kanpur (PG) Ckt-1 6) 400 KV Fatehpur-Kanpur (PG) Ckt-2 7) 220kV Bus-1 at Panki(UP) 8) 220kV Bus-2 at Panki(UP) 9) 220kV Panki-Kanpur South ckt 10) 220kV Panki-Kidwai ckt 11) 220kV Panki-BTHOR ckt 12) 220kV Panki-RPH ckt 13) 220kV Panki-CHBM ckt
12	GI-1	Rajasthan	24-Mar-2023 15:39	24-Mar-2023 16:02	00:23	190	0	0.457	0.000	41618	38782	i) During the antecedent condition, loading of ICT1 and ICT2 at AHEJLZ were approx. 126 and 183 MW respectively. ii) As reported, at 15:39 hrs, ICT 2 at AHEJLZ tripped on overloading due to increase in wind generation. iii) As per SCADA data, generation loss of approx. 190 MW occurred at AHEJLZ RE station pooled at Fatehgarh2. iv) As per PMU at AHEJLZ, no fault is observed in the system. v) As per PMU, change in MW generation of 190 MW and change in MVAR generation of 62 MVAR (+42 MVAR injecting to -20 MVAR absorbing) is observed at AHEJLZ RE station pooled at Fatehgarh2.	1) 220/33 kv 150 MVA ICT 2 at AHEJLZ PSS HB_FGRAH_PG (AHEJLZ)
13	GI-1	Punjab	24-Mar-2023 19:07	24-Mar-2023 20:18	01:11	0	0	0.000	0.000	40590	47131	i) As reported, at 19:07hrs, 220kV Moga(PG)-Mogan(PS) (PSTCL) ckt-1,2,3&4 (line length ~400meter) tripped from Moga(PG) end only. No CB opened from Mogan(PS) end. ii) As per DR submitted of Moga(PG) end, over-current earth-fault protection operated in all four lines at Moga(PG) end. Fault current in all the lines were in the range of 750A and cleared after approx. 1-1.5sec. It seems that probably fault was outside the line in the Punjab network. iii) There is differential protection in line which is in blocked condition due to absence of fiber optics. iv) As per PMU at Jalandhar(PG), R-N phase to earth fault with delayed clearance in 1560msec is observed. v) As per SCADA, no load loss has been observed in Punjab control area as Mogan(PS) has alternate connectivity from 220kV Firoz & Botia feeders.	1) 220 kv Moga(PG)-MOGAN(PS) (PSTCL) Ckt-1 2) 220 kv Moga(PG)-MOGAN(PS) (PSTCL) Ckt-2 3) 220 kv Moga(PG)-MOGAN(PS) (PSTCL) Ckt-3 4) 220 kv Moga(PG)-MOGAN(PS) (PSTCL) Ckt-4
14	GI-1	Jammu & Kashmir	26-Mar-2023 14:13	26-Mar-2023 15:33	01:20	0	300	0.000	0.820	40469	36595	i) 220/132kV Ziankote S/s have two bus at 220kV side i.e., main bus & reserve bus. ii) During antecedent condition, 220kV Ziankote was operating in bus split mode viz. 220kV Amargarh(INDIGRID) –Ziankote(JK) D/C was feeding Ziankote load and 220kV Wagoora-Ziankote(JK) was feeding Alusteng. iii) As reported by J&K, jumper at tower location no. 102 of 220kV Amargarh(INDIGRID) –Ziankote(JK) ckt-1 has snapped and line tripped. Line tripped from Ziankote end only. At the same time, 220kV Amargarh(INDIGRID) –Ziankote(JK) ckt-2 also tripped on over-current protection due to overloading occurred due to load shifting. Hence, load of only Ziankote affected due to tripping. iv) As per PMU at Kishenpur & Amargarh, no fault is observed in system. v) As per SCADA, load loss of approx. 300MW occurred in J&K control area. vi) 220kV Amargarh(INDIGRID) –Ziankote(JK) ckt-2 was restored at 15:33hrs and bus coupler was closed at Ziankote to meet maximum load. Around 120MW load at Ziankote was curtailed during that duration. vii) After restoring 220kV Amargarh(INDIGRID) –Ziankote(JK) ckt-1 at 19:30hrs, again 220kV Ziankote was kept in bus split mode.	1) 220kV Amargarh(INDIGRID) – Ziankote(JK)(PDD JK) ckt 1 2) 220kV Amargarh(INDIGRID) – Ziankote(JK)(PDD JK) ckt 2
15	GI-2	Uttar Pradesh	28-Mar-2023 19:13	28-Mar-2023 21:27	02:14	0	160	0.000	0.327	42182	48945	i) 400 kV Agra(UP) has double main transfer bus scheme. ii) During antecedent condition, 400 kV Agra(PG)-Agra(UP) (PG) ckt was under emergency shutdown to attend hot spot in Y-phase wave-trap at Agra(UP). iii) As reported, at 19:13 hrs, while charging 400kV Agra(PG)-Agra(UP) ckt, LBB protection operated at 400 kV Agra(UP) end. iv) Bus coupler did not open after LBB operation. So, all the elements connected to 400 kV Bus-1 & 2 tripped. It was also informed that, 400/220kV ICT-5 didn't trip as it is not incorporated in bus bar protection logic. v) At the same time, 220kV Agra(UP)-Agra_220 ckt-2, 132kV feeders from Agra(UP) to Etmadpur, Agra Fondry Nagar, Agra Taj, Bhimnagari and Sadabad also tripped due to SPS operation. vi) Load at Agra(UP) was managed partially through 220kV Agra(UP)-Shamsabad ckt and 220kV Agra(UP)-Agra_220 ckt-1. Hence, substitution did not become dead. vii) As per SOE, while charging 400kV Agra(PG)-Agra(UP) ckt line was first charged from Agra(UP) end. After ~10sec, while attempting charging from Agra(PG) end LBB protection at Agra(UP) operated. viii) As per DR received from Agra(UP), master trip command has not been initiated before LBB operation. After approx. 260ms of line charging attempt from Agra(PG) end, LBB protection operated without any initiation of master trip command. So it seems to be LBB mal-operation. ix) As per PMU at 765 kV Agra(PG), no fault is observed in the system. x) As reported by Agra TnC, LBB relay has been replaced by POWERGRID. However, reason of maloperation of LBB protection is not shared. xi) As per SCADA, load loss of approx. 160MW occurred in Uttar Pradesh control area.	1) 400/220 kv 500 MVA ICT 1 at Agra(UP) 2) 2400/220 kv 500 MVA ICT 2 at Agra(UP) 3) 400 KV Agra(UP)-Agra Fatehabad(UP) (PG) Ckt-1 4) 400 KV Agra(UP)-Agra Fatehabad(UP) (PG) Ckt-2 5) 400 KV Agra(UP)-Ummao(UP) Ckt 6) 220kV Agra(UP)-Agra_220 ckt-2 7) 132kV Agra(UP)-Etmadpur ckt 8) 132kV Agra(UP)-Agra Fondry Nagar ckt 9) 132kV Agra(UP)-Agra Taj ckt 10) 132kV Agra(UP)-Bhimnagari ckt 11) 132kV Agra(UP)-Sadabad ckt

Details of Grid Events during the Month of March 2023 in Northern Region



Sl No.	Category of Grid Event (GI for 2/ GD-1 to GD-5)	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration (H:MM)	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid*		Brief details of the event (pre fault and post fault system conditions)	Elements Tripped
						Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
16	Gi-1	Punjab	30-Mar-2023 21:17	30-Mar-2023 22:39	01:22	0	280	0.000	0.729	32345	38398	i) 220kV Jamalpur(BB) has double main bus scheme. There are two buses Bus-1&2 and Bus 2 is further divided into two part Bus2A & Bus2B separated by bus sectionalizer. ii) As reported, at 21:17hrs, 220 KV Jamalpur(BB)-Dandharikalani(PS) (PSTCL) Ckt-1&2 tripped on RYB 3 phase fault, fault distance was 176.4m and 3.8km from Jamalpur(BB) end for ckt-1&2 respectively, 220 KV Jamalpur(BB)-Ganguwal(BB) Ckt-2 also tripped at the same time on B-N phase to ground fault with distance 79.05km and fault current of 1.235kA from Ganguwal(BB) end. iii) As per SOE, 220/66 kV 315MVA ICT-1 at Dandharikalani(PS) and 220 KV Jamalpur(BB)-Sangrur(PS) (BB) Ckt-1 also tripped at the same time. Bus coupler at 220kV Jamalpur(BB) and bus sectionalizer between Bus2A and Bus2B at 220kV Jamalpur(BB) also got opened. Hence Bus-1 and Bus-2B remained charged and Bus-2A became dead. iv) As per PMU at 400 kV Jalandhar(PG), Y-N phase to ground fault followed by Y-B phase to phase fault with delayed fault clearance time of 240 msec is observed in the system. v) As per SCADA, load loss of approx. 280MW occurred in Punjab control area.	1) 220 KV Jamalpur(BB)-Dandharikalani(PS) (PSTCL) Ckt-1 2) 220 KV Jamalpur(BB)-Dandharikalani(PS) (PSTCL) Ckt-2 3) 220 KV Jamalpur(BB)-Sangrur(BB) Ckt-1 4) 220 KV Jamalpur(BB)-Ganguwal(BB) Ckt-2 5) 220/66 kV 315MVA ICT-1 at Dandharikalani(PS)
17	Gi-1	Rajasthan	31-Mar-2023 12:57	31-Mar-2023 15:55	02:58	220	0	0.521	0.000	42193	39914	i) During antecedent condition, 220kV Bhadla-Saurya Urja ckt-1 & ckt-2 was carrying approx. 177MW & 303MW respectively. ii) As reported, at 12:57hrs, 220kV Bhadla-Saurya Urja ckt-1 tripped. Line tripped from Saurya Urja end only. No relay indication is observed. Charging attempt failed at 13:49 hrs. iii) As per PMU, no fault in system is observed. iv) As per SCADA, change in generation of approx. 220MW is observed at Saurya Urja RE station.	1) 220kV Bhadla-Saurya Urja ckt-1
18	Gi-1	Uttarakhand	31-Mar-2023 16:29	31-Mar-2023 17:52	01:23	13	0	0.032	0.000	40276	37825	i) During antecedent condition, 40MW Unit-1 at Tanakpur HEP was running and generating approx. 13MW & 220/132kV ICT was carrying 66 MW towards Mahendranagar (Nepal). ii) As reported, at 16:29hrs, testing work was being done in PT of Unit-1. During testing the PT voltage to relay was disrupted momentarily which resulted in operation of backup impedance relay. The control cable from relay to CB was faulty hence CB could not open which led to LBB protection operation at unit-1. Due to this, 220 KV Tanakpur(NH)-CB Ganj(LUP) Ckt, 220/132 KV ICT at Tanakpur(NH) and 40MW Unit-1 at Tanakpur HEP tripped. iii) Due to tripping of 220/132 KV ICT at Tanakpur(NH), power flow to Mahendranagar (Nepal) became zero. iv) Due to opening of the elements, power flow to Sitarganj also became zero. v) As per PMU at Bareilly(PG), no fault in system is observed. vi) As per SCADA, generation loss of approx. 13MW is observed at Tanakpur HEP. vii) As reported by NHPC, fault in control of cable from relay to CB of unit-1 has already been rectified.	1) 220 KV Tanakpur(NH)-CB Ganj(LUP) Ckt 2) 220/132 KV ICT at Tanakpur(NH) 3) 40MW Unit-1 at Tanakpur HEP

Details of Grid Events during the Month of March 2023 in Western Region



Sl No.	Category of Grid Event	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration (HH:MM)	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid*		Brief details of the event (pre fault and post fault system conditions)	Elements Tripped
	(GI for 2/ GD-1 to GD-5)					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
1	GI-1	WR	02-Mar-23 07:42	02-Mar-23 08:05	00:23	-	150	-	0.002	71027	64162	At 07:42 hrs/02-03-2023, 220 kV Ponda-Xeldem 1 tripped on B phase to earth fault due to conductor snapping at location 239. 220 kV Amona-Ponda 3 tripped at Ponda substation since it was on the same bus with 220 kV Ponda - Xeldem. 220/110 kV Ponda-ICTs 1,2 &3 also tripped. Load loss of 150 MW occurred due to these trippings.	Tripping of 1. 220 kV Amona-Ponda 2&3 2. 220 kV Ponda-Xeldem 1 3. 220/22 kV Xeldem-ICTs 1&2 4. 220/110 kV Ponda-ICTs 1,2 &3
2	GD-1	WR	11-Mar-23 13:18	11-Mar-23 17:29	04:11	4	-	0.000	-	62152	61633	At 13:18 Hrs/11-03-2023, 220 kV Bhuj- Baranda tripped on B-E fault. Generation loss of 4 MW occurred at Baranda(ASIPL) due to the loss of evacuation path.	Tripping of 1. 220 kV Bhuj- Baranda
3	GD-1	WR	16-Mar-23 09:16	16-Mar-23 10:05	00:49	1105	-	0.017	-	66156	60919	At 09:16 Hrs/16-03-2023, 400 kV MB Power-Jabalpur 1 tripped on R-Y phase to phase fault and 400 kV MB Power-Jabalpur 2 tripped on B-E fault. Generation loss of 1105 MW occurred at MB Power due to the loss of evacuation path.	Tripping of 1. 400 kV MB Power-Jabalpur 1&2 2. 400 kV MB Power Bus 1&2 3. 400 kV MB Power Unit 1&2 (600 MW)
4	GD-1	WR	16-Mar-23 16:29	23-Mar-23 19:20	02:51	53	-	0.001	-	65057	60507	At 16:29 Hrs/16-03-2023, 220 kV Bhuj- Baranda tripped on B-E fault. Generation loss of 53 MW occurred at Baranda(ASIPL) due to the loss of evacuation path.	Tripping of 1. 220 kV Bhuj- Baranda
5	GD-1	WR	17-Mar-23 06:58	17-Mar-23 08:57	01:59	11	-	0.000	-	65409	61116	At 06:58 Hrs/17-03-2023, 220 kV Bhuj-Gadhsisa tripped on B-E fault. Generation loss of 11 MW occurred at Gadhsisa (Renew Power) due to the loss of evacuation path.	Tripping of 1. 220 kV Bhuj-Gadhsisa
6	GI-1	WR	17-Mar-23 10:12	17-Mar-23 10:20	00:08	-	222	-	0.004	66213	62227	At 10:12 hrs/17-03-2023, 220/110 kV Thivim-ICTs 1,2&3 tripped on Over-Current protection operation due to sudden increase in Konkan Railways traction load. Due to these trippings load loss of 222 MW occurred.	Tripping of 1. 220/110 kV Thivim ICTs 1,2&3
7	GI-2	WR	19-Mar-23 21:32	20-Mar-23 05:05	07:33	-	-	-	-	56400	47158	At 21:32 Hrs/19-03-2022, Y phase CT of 765 kV Dharamjaygarh- Ranchi 2 (Main Bay 728) failed at 765 kV Dharamjaygarh substation. Even though Bus bar Protection operated in CU, Tripping commands were not being issued to concerned PU's and all the connected lines on 765 kV Dharamjaygarh Buses 3 &4 tripped on either Zone 2 DPR operation from remote end or Reverse Zone DPR operation at Dharamjaygarh end. As reported by PGCIL, "Lck Lev 2 Zone 1" & "Lck Lev 2 Zone 2" signals were also observed in DRs of Busbar Protection relay along with 87 BB Differential Protection operation. These Locking Lev 2 conditions blocks both Bus Bar differential & LBB functions and led to non extension of Bus Bar tripping from the relay in this case. Issue was referred to OEM for investigation of cause of Locking Lev 2 and Non reporting of blocking alarm in SCADA	Tripping of 1. 765 kV Dharamjaygarh Bus 3&4 2. 765 kV Dharamjaygarh-Jabalpur 3&4 3. 765 kV Dharamjaygarh-Jharsuguda 1&2 4. 765 kV Dharamjaygarh-Tamnar 1&2 5. 765 kV Dharamjaygarh-Ranchi 1&2 6. 765 kV Dharamjaygarh Bus Reactor 3
8	GD-1	WR	24-Mar-23 12:22	25-Mar-23 18:05	05:43	74	-	0.001	-	64305	60640	At 12:22 Hrs/24-03-2023, 220 kV Bhuj- Baranda tripped on B-E fault. Generation loss of 74 MW occurred at Baranda(ASIPL) due to the loss of evacuation path. As reported by ASIPL, foreign object found in the line at tower number 143. Due to ROW issue, line charging was delayed and after resolving the same, foreign object was removed and line charged at 18:05 Hrs/25-03-2023.	Tripping of 1. 220 kV Bhuj- Baranda

Details of Grid Events during the Month of March 2023 in Western Region



Sl No.	Category of Grid Event (GI for 2/ GD-1 to GD-5)	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration (HH:MM)	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid*		Brief details of the event (pre fault and post fault system conditions)	Elements Tripped
						Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
9	GD-1	WR	28-Mar-23 10:37	28-Mar-23 11:23	00:46	2416	-	0.037	-	65819	63956	At 10:37 Hrs/28-03-2023, 400 kV Korba Bus 3 tripped on BB protection operation due to B phase conductor snapping. Prior to the event, 400 kV Bus 4 emergency outage was taken by NTPC for attending R-phase conductor problem which was hanging due to broken shoe clamp. All the loads of 400 kV Korba Bus 4 was shifted to 400 kV Korba Bus 3 and PTW was issued at 08:30 am. As the Bus sectionalizer was not tripped with the BB protection operation, all the lines connected to 400 kV Korba tripped from korba end on Zone 4 DPR operation or remote end on Zone 2 DPR operation. Generation loss of 2416 MW occurred due to the loss of evacuation path.	Tripping of 1. 400 kV Korba- Bhilai 1&2 2. 400 kV Korba- Birsingpur 1&2 3. 400 kV Korba- Raipur 3&4 4. 400 kV Korba- Sipat 5. 400 kV Korba- Bhatapara 6. 400 kV Korba- Korba(W) 7. 200 MW KSTPS Units 1,2&3 8. 500 MW KSTPS Units 4,5,6&7
10	GD-1	WR	28-Mar-23 21:47	28-Mar-23 22:10	00:23	-	11.52	-	0.000	64244	56197	At 21:47 Hrs/28-03-2023, R-phase CT of 220/132 kV Shujalpur(MP) ICT-3 failed due to which all the elements connected to 220 kV Bus at Shujalpur(MP) tripped & led to blackout of the substation. As the BB protection was out of service due to communication module failure, fault was cleared by reverse zone distance protection operation of lines and O/C protection operation of ICTs 1&2. 220/132 kV Shujalpur(MP) ICT-3 tripped on differential protection operation. Load loss of 11.52 MW was reported by SLDC MP.	Tripping of 1. 220 kV Shujalpur-Shujalpur(MP) 1&2 2. 220/132 kV Shujalpur(MP) ICTs 1,2&3
11	GD-1	WR	28-Mar-23 17:12	28-Mar-23 19:22	02:10	-	654	-	0.011		60705	At 17:12 Hrs/28-03-2023, 220 kV Raigarh- Raigarh(PG) 3 tripped on B-E fault. 220 kV Raigarh- Raigarh (PG) 1&2 and 220 kV Raigarh- Korba(East) tripped on O/C protection operation. With these tripping, 220 kV Raigarh station went dark. There was a load loss of around 654 MW due to the event.	Tripping of 1. 220 kV Raigarh- Raigarh(PG) 1,2&3 2. 220 kV Raigarh- Korba (East)
12	GD-1	WR	30-Mar-23 01:20	30-Mar-23 02:30	01:10	142	-	0.002	-	65037	57401	At 01:20 Hrs/30-03-2023, 220 kV Indore(PG)- Pritamnagar tripped on R-E fault. Generation loss of 142 MW occurred at Pritamnagar(AWEMP1PL) due to the loss of evacuation path.	Tripping of 1. 220 kV Indore(PG)- Pritamnagar
13	GD-1	WR	30-Mar-23 15:05	30-Mar-23 19:21	04:16	61	-	0.001	-	66109	60029	At 15:05 Hrs/30-03-2023, 220 kV Bhuj- Baranda tripped on B-E fault. Generation loss of 61 MW occurred at Baranda(ASIPL) due to the loss of evacuation path. As reported by ASIPL, foreign object found in the line at tower number 74.	Tripping of 1. 220 kV Bhuj- Baranda
14	GD-1	WR	30-Mar-23 16:18	30-Mar-23 17:47	01:29	77	-	0.001	-	66221	59438	At 01:20 Hrs/30-03-2023, 220 kV Indore(PG)- Pritamnagar tripped on E/F protection operation due to mal-operation of L90 Relay (Loose connection found after checking the relay and the same was rectified). Generation loss of 77 MW occurred at Pritamnagar(AWEMP1PL) due to the loss of evacuation path.	Tripping of 1. 220 kV Indore(PG)- Pritamnagar
15	GD-1	WR	31-Mar-23 06:53	31-Mar-23 07:19	00:26	-	360	-	0.006	63735	58295	At 06:53 Hrs/31-03-2023, 220 kV Gurur- Barsoor tripped on R-E fault. At the same time, 220 kV Gurur- Narayanpur tripped from Gurur end on E/F protection operation. 220 kV Gurur- Kurud 1&2 tripped from Kurud end on Zone 2 Distance protection operation. 220 kV Gurur- Bhilai 1&2 which was under idle charged condition for load regulation became dead due to these tripping. With these tripping, 220 kV Gurur station became dead. As reported by CSLDC, there was a load loss of around 360 MW.	Tripping of 1. 220 kV Gurur- Barsoor 2. 220 kV Gurur- Narayanpur 3. 220 kV Gurur- Kurud 1&2 4. 220 kV Gurur- Bhilai 1&2

Details of Grid Events during the Month of March 2023 in Southern Region



Sl No.	Category of Grid Event	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid		Brief details of the event (pre fault and post fault system conditions)	Name of Elements (Tripped/Manually opened)
	(GI for 2/ GD-1 to GD-5)					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
1	GD-1	Karnataka	03-Mar-23 12:50	03-Mar-23 13:20	30mins	29	182	0.05%	0.31%	56600	57902	Complete Outage of 220kV Suzlon_Honnahalli_Wind of Suzlon_KA and Multiple Trippings at 220kV/66kV Honnali SS, 220kV/110kV KB Cross SS and 220kV/110kV MRS Shimoga SS of KPTCL: During antecedent conditions, 220kV/66kV Honnali SS, 220kV/110kV KB Cross SS and 220kV/110kV MRS Shimoga SS were operating with split bus condition at 220kV level. 220kV Suzlon_Honnahalli_wind is radially connected to 220kV/66kV Honnali SS. 220kV Bus-2 of 220kV/66kV Honnali SS and 220kV/110kV KB Cross SS are radially connected to 220kV/110kV MRS Shimoga SS. As per the reports submitted, the triggering incident was LBB maloperation in 220kV MRS Shimoga Anthrasanahalli line at MRS Shimoga end causing tripping of all the elements connected to Bus-1 to trip. This resulted in a complete outage of 220kV Suzlon_Honnahalli_wind and multiple trippings at 220kV/66kV Honnali SS, 220kV/110kV KB Cross SS and 220kV/110kV MRS Shimoga SS.	1. 220kV Hassan-PG MRS Shimoga 2. 220kV MRS Shimoga Varahi-1 3. 220kV MRS Shimoga Shrivathy-1 4. 220kV MRS Shimoga Anthrasanahalli 5. 220kV MRS Shimoga KB Cross 6. 220kV MRS Shimoga Gerusoppa 7. 220kV/110kV 100MVA Transformer-1 at MRS Shimoga 8. 220kV/66kV 100MVA Transformer-2 at MRS
2	GD-1	Andhra Pradesh	09-Mar-23 00:50	09-Mar-23 01:05	15mins	0	149	0.00%	0.32%	36743	46693	Complete Outage of 220kV/132kV Paravada SS of APTRANSCO: During antecedent conditions, 220kV Anrak Paravada was under idle charged condition. As per the reports submitted, the triggering incident was YB-N fault in the 220kV Paravada VSS line. Tripping of the only connected line resulted in complete outage of 220kV/132kV Paravada SS.	1. 220kV VSS Paravada
3	GD-1	Tamil Nadu	13-Mar-23 14:39	13-Mar-23 15:09	30mins	0	260	0.00%	0.44%	52584	59705	Complete Outage of 230kV/110kV/33kV Hosur SS of TANTRANSCO: 230kV/110kV/33kV Hosur SS has single bus configuration at 230kV level. As per the reports submitted, the triggering incident was 230kV Bus BBP operation at Hosur end and all the elements connected to the bus tripped. This led to complete outage of 230kV/110kV/33kV Hosur SS.	1. 230kV Hosur Mettur line 2. 230kV Hosur Shoolagiri Line-1&2 3. 230kV/110kV Auto Transformer-1,2&3
4	GD-1	Karnataka	16-Mar-23 18:01	16-Mar-23 19:10	1hr 09mins	0	0	0.00%	0.00%	40225	47075	Complete Outage of 220kV/66kV Tirumani SS-1, 220kV/66kV Tirumani SS-2 and 220kV/66kV Rychalu_1 SS of KSPDCL: As per the reports submitted, the triggering incident was the operation of over voltage protection of 220kV Pavagada Tirumani Line-1&2, 220kV Pavagada Rychalu line at Tirumani and Rychalu ends respectively. Since 220kV/66kV Tirumani SS-1, 220kV/66kV Tirumani SS-2 and 220kV/66kV Rychalu_1 SS are radially connected to Pavagada, tripping of these lines resulted in a complete outage of 220kV/66kV Tirumani SS-1, 220kV/66kV Tirumani SS-2 and 220kV/66kV Rychalu_1 SS.	1. 400kV Pavagada Mysore-1 2. 220kV Pavagada Tirumani-1,2 3. 220kV Pavagada Rychalu_1
5	GD-1	Karnataka	16-Mar-23 10:40	16-Mar-23 10:50	10mins	0	40	0.00%	0.06%	53669	62578	Complete Outage of 220kV Kadra PH of KPCL and 220kV/110kV Karwar SS of KPTCL: During antecedent conditions, 220kV Kaiga Kadra and 220kV Kaiga Kodsalli lines were under idle charged condition. 220kV Kadra PH and 220kV/110kV Karwar SS were radially connected through 220kV Kadra Kodsalli line. As per the reports submitted, the triggering incident was tripping of 220kV Kadra Kodsalli line at Kadra end due to relay maloperation. Tripping of the only connected line resulted in complete outage of 220kV Kadra PH and 220kV/110kV Karwar SS.	1. 220kV Kadra Kodsalli
6	GD-1	Tamil Nadu	17-Mar-23 12:30	17-Mar-23 14:44	2hr 14mins	0	210	0.00%	0.38%	49227	55565	Complete Outage of 230kV/110kV Taramani SS of TANTRANSCO: 230kV/110kV Taramani SS has single bus configuration at 230kV level. As per the reports submitted, the triggering incident was YN fault in 230kV Bus. 230kV BBP operation at 230kV/110kV Taramani SS resulting in complete outage of 230kV/110kV Taramani SS.	1. 230kV Taramani Sripurumbudur 2. 230kV Taramani Kaliventhapattu 3. 230kV Taramani KITZ 4. 230kV Taramani Rapuram 5. 230kV Taramani Mylapore
7	GD-1	Karnataka	18-Mar-23 17:18	18-Mar-23 19:12	1hr 54mins	0	0	0.00%	0.00%	38262	47252	Complete Outage of 220kV/66kV Tirumani SS-1 of KSPDCL: As per the reports submitted, the triggering incident was B-N fault in 220kV Tirumani Pavagada line and the line tripped at both ends. Tripping of this only connected line resulted in a complete outage of 220kV/66kV Tirumani SS-1.	1. 220kV Pavagada Tirumani Line-1
8	GI-1	Telangana	02-Mar-23 01:40	02-Mar-23 03:23	1hr 43mins	0	0	0.00%	0.00%	40464	47273	Tripping of 220kV Bus-1 of 220kV Upper Jurala PH of TSGENCO: During antecedent conditions, there was no generation at 220kV Upper Jurala PH. As per the reports submitted, the triggering incident was R-N fault in 220kV Jurala Raichur_KA Line-1. At the same time, the Bus Coupler tripped on over current protection. Tripping of only connected line and bus coupler resulted in de-energization of 220kV Bus-1 at 220kV Upper Jurala PH.	1. 220kV Jurala Raichur_KA Line-1 2. 220kV Bus coupler at 220kV Jurala PH
9	GI-1	Andhra Pradesh	19-Mar-23 21:15	19-Mar-23 21:25	10mins	0	0	0.00%	0.00%	35111	41483	Tripping of 220kV Bus of 220kV/132kV Paravada SS of APTRANSCO: 220kV/132kV Paravada SS has single bus configuration at 220kV level. As per the reports submitted, the triggering incident was the operation of 220kV BBP at Paravada SS while charging 220kV VSS Paravada line. 132kV was intact at 220kV/132kV Paravada SS during the event.	1. 220kV VSS Paravada line

Details of Grid Events during the Month of March 2023 in Southern Region



Sl No.	Category of Grid Event	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid		Brief details of the event (pre fault and post fault system conditions)	Name of Elements (Tripped/Manually opened)
	(GI Ior 2/ GD-1 to GD-5)					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
10	GI-1	Kerala	20-Mar-23 17:09	20-Mar-23 17:34	25mins	0	139	0.00%	0.29%	41094	48070	Tripping of 110kV Bus of 220kV/110kV Kunnamangalam SS of KSEB: As per the reports submitted, the triggering incident was tripping of 220kV/110kV Transformer-1&2 on over current protection. At the same time, 110kV Kunnamangalam Chavayur line and 110kV Kunnamangalam Koduvally lines tripped at remote ends. Tripping of both transformers and lines led to the loss of supply to 110kV Bus and caused a load loss of 139MW. 220kV was intact during the event 220kV/110kV Kunnamanglam SS .	1.220kV/110kV Transformer-1&2 at Kunnamangalam

Details of Grid Events during the Month of March 2023 in Eastern Region



Sl No.	Category of Grid Event	Affected Area	Time and Date of occurrence of Grid Event	Time and Date of Restoration	Duration (HH:MM)	Loss of generation / loss of load during the Grid Event		% Loss of generation / loss of load w.r.t Antecedent Generation/Load in the Regional Grid during the Grid Event		Antecedent Generation/Load in the Regional Grid		Brief details of the event (pre fault and post fault system conditions)	Elements Tripped
	(GI 1 or 2/ GD-1 to GD-5)					Generation Loss(MW)	Load Loss (MW)	% Generation Loss(MW)	% Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
1	GI-2	Adhunik (APNRL)	12.03.2023 20:29	13.03.2023 00:49	04:20	485	0	1.61%	0.00%	30066	21970	At 20:31 Hrs, both units at Adhunik (270 MW each) tripped. As reported, generator differential protection operated in U#2 and supply to all auxiliaries failed. Supply to two of three CW pumps was from U#2 auxiliary, tripping of which led to low vacuum pressure of U#1 and U#1 also tripped at the same time.	U#1 and U#2 at Adhunik (APNRL)
2	GD-1	Dikchu	26.03.2023 04:02	26.03.2023 05:30	01:28	0	0	0.00%	0.00%	28090	20597	At 04:02 Hrs, 400 kV Rangpo-Dikchu tripped due to B_N fault. At the same time, 400 kV Teesta 3-Dikchu tripped from Teesta 3 end. This led to total power failure at Dikchu. There was no generation or load loss at Dikchu as no unit was running at that time.	400 kV Teesta 3-Dikchu 400 kV Rangpo-Dikchu
3	GD-1	Chatra, Latehar	31.03.2023 18:23	31.03.2023 19:38	01:15	0	24	0.00%	0.11%	29150	20924	At 18:23 Hrs, 220 kV Daltonganj-Latehar-Chatra (220 kV Daltonganj-Chatra-2 LLOed at Latehar) tripped due to B_N fault, leading to total power failure at Latehar S/s. At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 also tripped, leading to total power failure at Chatra S/s also. Total 24 MW load loss occurred.	220 kV Daltonganj-Latehar-1 220 kV Latehar-Chatra-1 220 kV Daltonganj-Chatra-1