

Detailed Report

Date of Submission : 07-08-2026 15:04

HOOTAGALLI - 220KV tripped at 22-07-2026 16:23 and restored at 22-07-2026 16:59

Summary of Event (घटना का सारांश) :

Event Summary:

On 22nd July 2026 at 16:19 Hrs, grid disturbance occurred in Mysore area following the operation of Bus Bar Protection and 220 kV Bus II tripping at Bastipura PGCIL sub Station. Sequence of trippings occurred thereafter are as follows:

1. At 16:19:57 Hrs : Operation of Bus -II Bus bar protection at Bastipura, following lines tripped at Bastipura end:

- i). Bastipura-Hootagally-1
- ii). Bastipura-Kadakola-1
- iii). Bastipura-Hunsur 1
- iv). Bastipura-Tubinakere

Following the tripping of Bus Bar-II, the entire power flow was transferred to the remaining Bus Bar-I connected transmission lines. Since the parallel circuits were designed to share load under normal operating conditions, this sudden transfer caused substantial loading on the healthy circuits. The affected transmission lines were protected through 800/1 Current Transformers, and the increased current resulted in significant overloading of the conductors and associated jumpers at 220kV Hunsur R/s, 220kV Kadakola and 220kV Hootagally R/s.

2. The 220kV Bastipura-tubinakere Line tripping due to 220 kV Bastipura Bus Bar-II fault did not affect any load at 220kV Tubinakere R/s as there was an alternate supply from 220kV Shanthigrama R/s.

3.Operation of Hunsur SPS (16:22 Hrs)

The overload condition was detected and SPS operated at 220 kV Hunsur. The SPS is programmed such that if one ICT at Bastipura becomes unavailable and the remaining ICTs experience overload due to contingency conditions, a predetermined load is automatically shed to maintain system stability. The SPS operated successfully at 16:22 Hrs and shed the designated load, thereby reducing transmission loading and maintaining stability of the Hunsur system. The operation of the Hunsur SPS was found to be in order.

4. Overloading at Hootagally 220kV SS:

At Hootagally, line over load SPS operated at 16:22Hrs and local load of 91 MW was tripped due to SPS operation. Due to sustained overloading, 220kV Bastipura-hootagally line-1 tripped at Hootagally end at 16:23Hrs due to overload (at 125% of the line CT ratio, due to issue in Siemens Relay).

5. Overloading at Kadakola 220kV SS:

At Kadakola, line over load SPS operated at 16:22 Hrs. However, due to failure of the SPS output contactor, the intended load-shedding was not realized. However, Shift Engineers immediately acted by reducing the load by tripping the 66kV lines manually (around 35MW). Due to continuous loading of 220kV Bastipura-kadakola line 1, failure of jumper led to imbalance in load causing tripping in backup OCR due to VTF failure at 16:23Hrs

6 Tripping of 220 kV Kannyambetta and 220 kV Bastipura-Kadakola Line-1

At **16:23:31 Hrs**, the 220 kV Kannyambetta line tripped sensing phase to phase fault in Zone-1, fault current: Ia- 1290Amps, Ib-1392 Amps, Ic- 3402 Amps, Va -114kV, Vb- 90kV and Vc-1.6kV. Tripping of 220kv Kadakola-Kannyambetta line resulted in grid failure. The relay indications are consistent with a Phase-to-Phase fault, caused by jumper failure.

Time and Date of the event (घटना का समय और दिनांक) : 22-07-2026 16:23

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

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

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

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

Bus Configuration Type : Double Bus with Bus coupler

Bus Coupler Status : NA

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

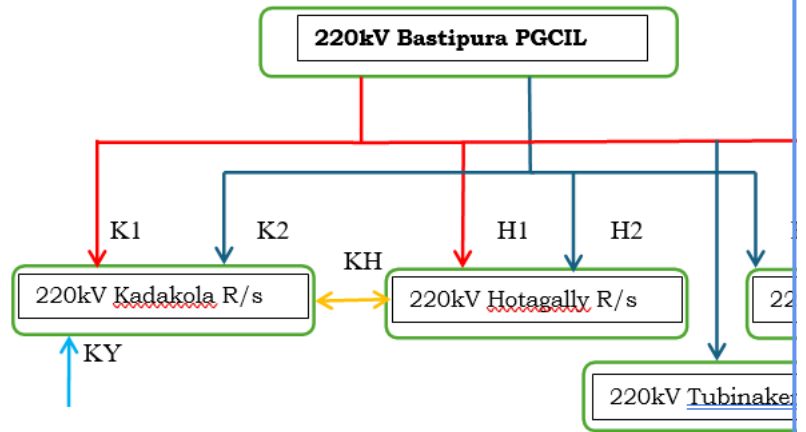
Station Connectivity / SLD during antecedent :

Weather Conditions : Normal

Elements under outage prior to the event :

Other Information (Antecedent Cnditions) : **1. Prefault System Configuration in Mysore Area:**

The affected 220 kV transmission network is as shown below.



- H1, H2 – Bastipura–Hootagally Lines 1 & 2
- K1, K2 – Bastipura–Kadakola Lines 1 & 2
- Hu1, Hu2 – Bastipura–Hunsur Lines 1 & 2
- KY – Kadakola–Kannyambetta Line
- KH – Kadakola–Hootagally Line
- Red Bus – Bus Bar-I; Blue Bus – Bus Bar-II

2. System Loading Before and After Disturbance:

220kv Lines	Before Disturbance	After Bus Bar-II Operation at Bastipura	220k
Bastipura–Hootagally Line 1	569 A (208 MW)	≈ 1200 Amps	Hoota
Bastipura–Hootagally Line 2	559 A (200 MW)	0	
Bastipura–Kadakola Line 1	503 A (181 MW)	830 A	Kada
Bastipura–Kadakola Line 2	503 A (181 MW)	0	
Bastipura–Hunsur Line 1	207 A (75 MW)	0	Hur
Bastipura–Hunsur Line 2	207 A (75 MW)	92 MW	
Kadakola–Kannyambetta Line	76 A (6.9 MW)	Increased (value not recorded)	Kada
Kadakola–Hootagally Line	313 A (113 MW)	Increased (value not recorded)	Kada

The above data clearly indicates that the operation of Bus-II, Bus bar protection at Bastipura PGCIL substation resulted in sudden redistribution of power through the healthy transmission corridors, leading to severe loading of the 220kV Bastipura–Hootagally Line 1, 220kv Bastipura–Kadakola Line 1 and 220kv Kannyambetta line.

There was around 842 MW load in the Mysore Region in the Prefault scenario with following embedded Generation:

At 220kV SS Madhuvanahally: 84 MW Vardha Solar generation connected to Madhuvanahally 220kV Bus.

At 220kV SS Hebbani: Hydro generation of around 3 MW connected to Hebbani bus.

Other than Bastipura ICTs, Kanyambet was the one more grid support available.

Elements under outage prior to the fault:

Vajamangala-TK Hally line was kept open from 23.06.2026.

Renewable Energy Trip : False

Details of SPS Operation (if any): : False

Reason of tripping :

Load and Generation Loss (लोड और जेनरेशन हानि) :

Total Generation Loss (MW)	Total Load Loss(MW)
87 MW	842 MW

Duration of interruption (रुकावट की अवधि) :

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

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

Station Connectivity/SLD during the event :

Analysis of the event : **Findings and Remedial Measures taken details:**

The investigation indicates the following:

1. The triggering incident was 220kV Bus-2 tripping at Bastipura which resulted in sudden redistribution of power through the healthy transmission corridors, causing significant overloading and stress on the line jumpers. The Hunsur SPS functioned. The 220kv Bastipura-tubinakere Line tripping due to 220 kV Bastipura Bus Bar-II fault did not affect any load as there was an alternate supply to 220kv Tubinakere SS from 220kv Shanthigrama PGCIL
2. The 220 kV Hootagally SPS logic operated correctly. However, during the investigation it was observed that, although all overload protection functions in the Siemens relay had been disabled, the analogue current comparator channel (125%) remained wired in the relay's CFC (Continuous Function Chart) logic, which was configured with an intentional time delay of three minutes. As a result, when the overload condition persisted continuously for more than three minutes, the overload signal continued to be processed by the CFC, causing operation of the relay under overload conditions.
3. The Kadakola SPS logic also operated correctly, but load relief was not realised due to failure of the output contactor.
4. Due to stressed system and low voltage condition, the RE generation connected to Madhuvanahally SS tripped, subsequently, due to overload of Transformers at 220kV chamarajanagara SS, local SPS operated and reduced the load by tripping the 66kv lines.

5. Sustained continuous loading resulted in failure of the jumper led to tripping of 220kV Bastipura-kadakola line-1 at 220Kv Kadakola SS, leading to operation of protection relays and tripping of transmission line.
6. Subsequent transfer of the entire load on to 220kV kannyambetta line at 220kv kadakola SS and due to zone 1 fault resulted in tripping 220kv Kannyambetta line due to jumper failure resulted in complete outage of following 220kV Substations:

Protection / Operational Issues observed :

Restoration Details :

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

Remedial Measures Taken (सुधारात्मक सुझाव) :

Remedial Measures taken details

1. At Kadakola, replaced the defective output contactor (CMR) and carry out end-to-end functional testing of the SPS.
2. Inspection and strengthening of jumpers in all 220 kV lines is under way, hotline works are done wherever possible.
3. At Kadakola, overload setting using analogue current comparator channel (125%) remained wired in the relay's CFC (Continuous Function Chart) logic has been disabled. Same is checked in all Seimnes relays in Mysore Zone.
4. As per the approved SPS, load relief had to be realised from Hootagally/Kadakola downstream stations also by sending SPS signal through PLCC. The same is to be checked jointly by RT and TCD wings.
5. The internal clock of the Siemens relay was found not synchronized with the station time reference, resulting in inaccurate time stamps in the Disturbance Recorder (DR). It is recommended to synchronize the relay clock with the station GPS time synchronization system, wherever feasible, to ensure accurate event logging and facilitate reliable disturbance analysis.

Relay/PLCC Operation Details :

Control Panel Anunciation :

Main I Relay Indications :

Main II Relay Indications :

Other Relay Indications :

PLCC Counter Increment I/T :

PLCC Counter Increment D/T :

Fault Current Value (kAmp) : None

LA Counter :

Remarks :

Attachments :