

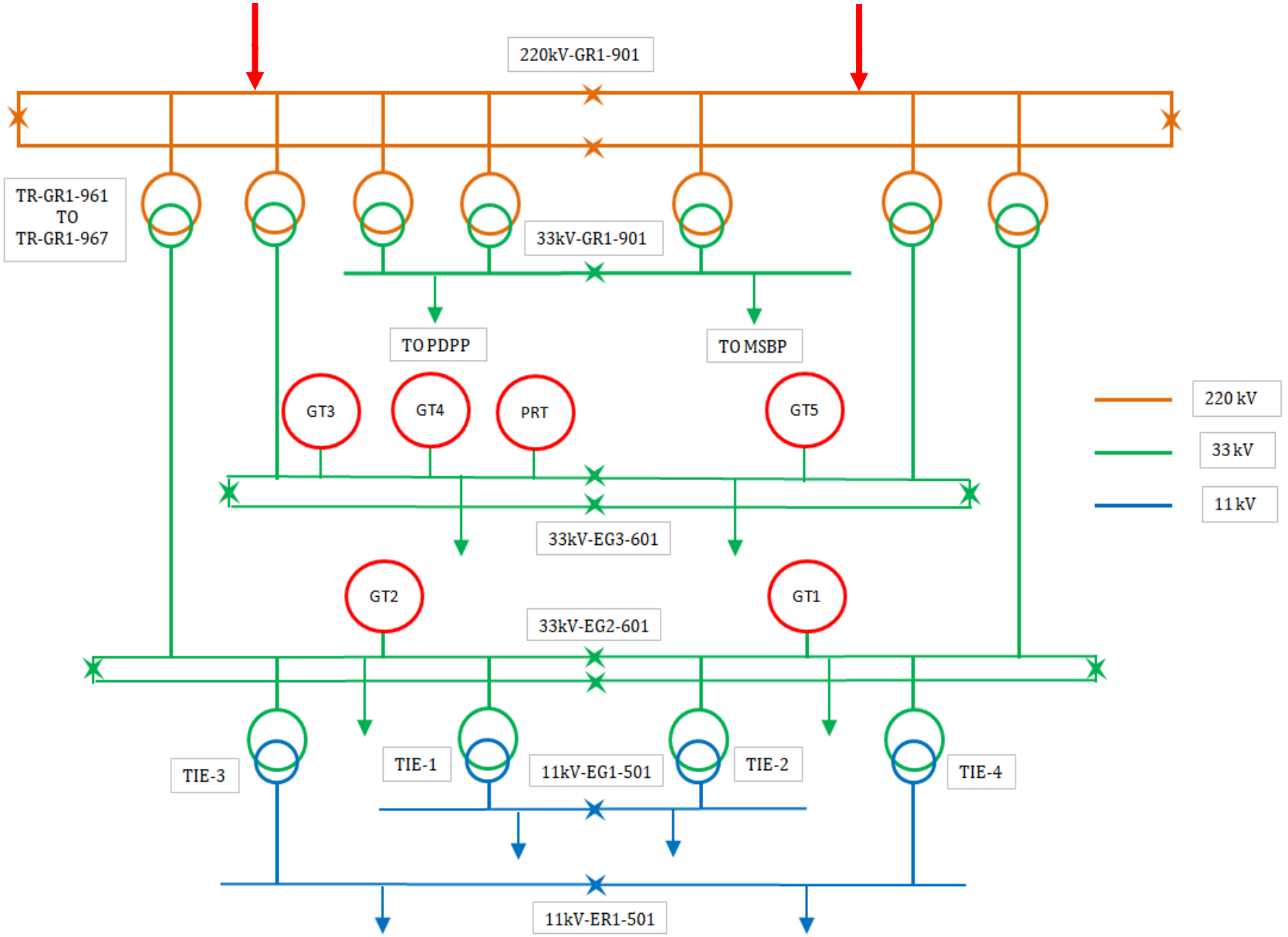
SURAKSHA SAMWAD

29-12-2022

BPCL Kochi Refinery

- Largest PSU Refinery in India
- 15.5 MMTPA
- Refinery Electrical Load – 140MW
- Petro Chemical Complex - 24MW
- Generators – 6Nos, Motors ~5500, Transformers-370, Substations – 81, 220kV GIS -17bays, Capacitor banks -36,

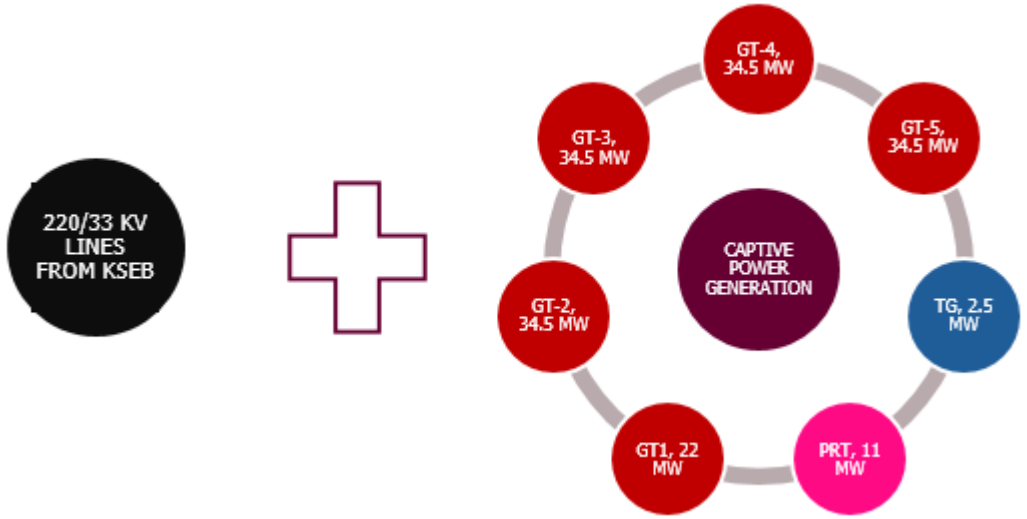
SLD after 220kV GIS commissioning



Power Sources

1. In House Generators
    1. Gas Turbo Generators (@CPP) : GTG1/2/3/4/5
    2. Power Recovery Turbine(@PFCCU) : PRT
    3. Turbo Generator (@ Old Utility) : TG

2. Grid Power
    1. KSEB
    2. Open Access



3. **Emergency Diesel Generators**
   250kVA -1 No, 500kVA-4 Nos,
   1.0 MW-2 No, 3.4 MW -2 No

Incident description

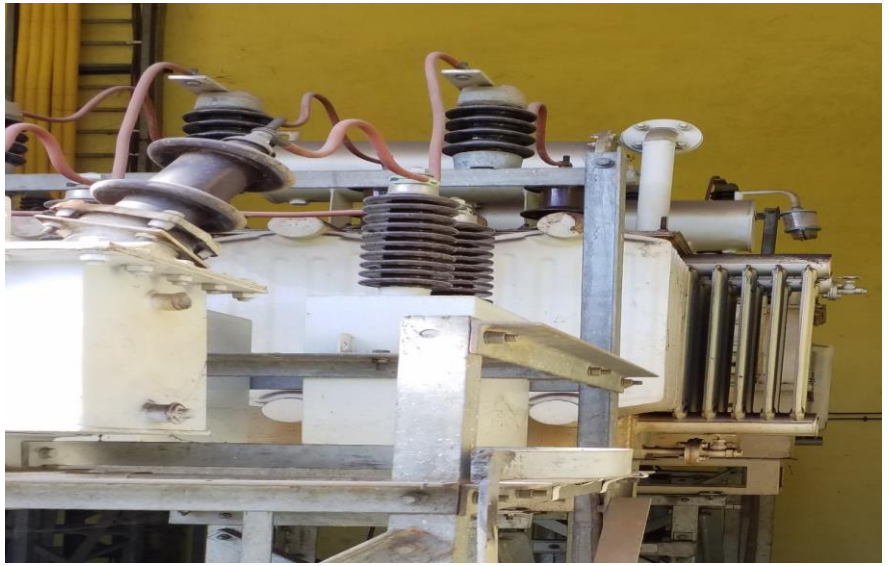
High potential near miss in capacitor bank

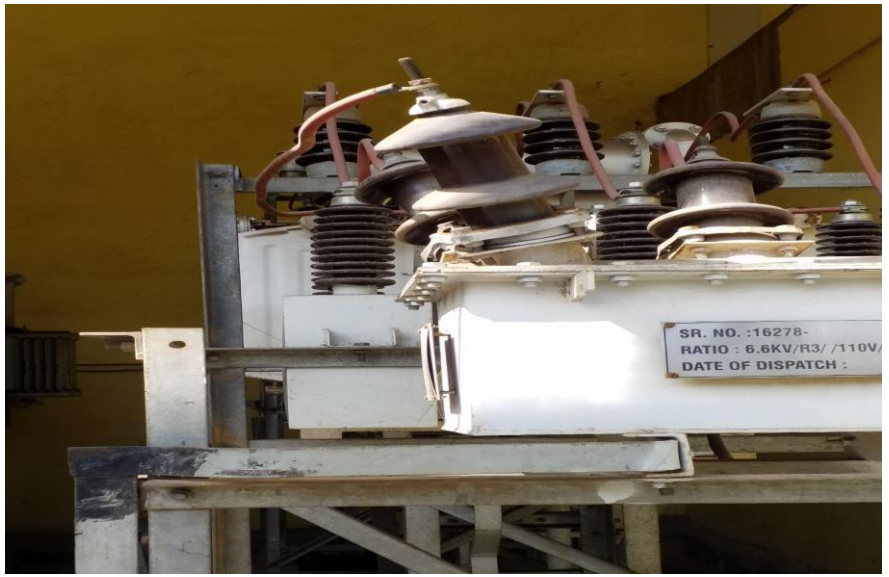
Normal procedure – PM check of Capacitor Bank

- BPCL technician group along with contract assistance group is scheduled for the job
- Permit is issued to working group after de energization of capacitor bank
- Checking of capacitor bank with noncontact voltage detector by working group
- Earthing of capacitor bank before starting work to ensure proper discharge

Capacitor bank







Incident

- Technician Scheduled for PM check on 11/03/2018
- Capacitor bank isolated and permit issued.
- On check with the Non contact voltage detector, a high voltage was indicated
- On detailed checking found that Capacitor bank was live

Incident Analysis

- Operations group was scheduled for de-energisation of capacitor bank
- A different capacitor bank was de energized due to equipment tagging mistake
- No visual or audible indications for working group to ensure isolation of capacitor bank (like humming sound of the transformer or rotation of motor)
- Break Glass to Trip – type emergency push button station was used. Hence for normal PM check jobs same was not activated.
- Non contact voltage detector averted an accident

Break Glass to trip - Push Button



Normal break glass push button with no visual On/Off indication

Corrective actions

- All the capacitor banks at the area switched off for detailed checking of tagging and necessary corrections done
- New PBS with On/Off indication and stay put stop was provided at all capacitor bank yard
- Checking with noncontact voltage detector made mandatory prior to start of work
- Separate lock and key for different capacitor banks

New Push button station



New push button with visual On/Off indication

Non-Contact Voltage detector



Different lock for different capacitor bank



Different lock for capacitor bank yards



Existing common lock for transformer yards

Thank You