

Case study

S1-1068 Performance at Power Grid Corporation of India in 765 Kv charged substation

The Power Grid Corporation of India Limited (PGCIL) is an Indian state-owned company headquartered in Gurugram, North India and engaged mainly in Transmission of Power & transmits about 50% of the total power generated in India on its transmission network. The company owns and operates about 1,61,790 circuit kms of transmission lines at 800/765kV, 400kV, 220kV & 132kV EHVAC & +500kV HVDC levels and 248 sub-stations. Also, it has the transformation capacity of about 3,96,825 MVA as on 30th November 2019.



At Power Grid Substation, more than 220 KV class routine and preventive tests are always a challenge due to limited period of shut down available for all testing needed to be completed. Instrument with less noise is a challenge and many times test instrument fails.

Most common challenges :

- High noise current in environments
- Transients
- Surface leakage
- Electroendosmosis
- Poor short circuit current in IR unit.
- Less Accuracy while using Guard terminal for measurements

Specific challenges faced by PGCIL while measuring Insulation Resistance :

- Erratic reading while measuring IR, DAR & PI
- High noise current in substation leads to test instrument failure
- Un-safe conditions for the operator



Case study

The same tests were performed during technical evaluation of one tender for demonstration of Insulation resistance at PGCIL 765 KV substation, Gaya (East India) where three competitors were invited to demonstrate their product offering to test on different specimen like CT & Transformer (with connected jumpers)

First specimen :

It was a tough competition between Megger (S1-1068) & Brand 1 in a 765 Kv circuit breaker where noise present was 4.9mA with successful demonstration against Brand 2 which was unable to inject voltage in such harsh conditions.

Second specimen :

Second rugged specimen was Transformer with jumper connected and bus bars with almost 400 m long conductor connected with CT, LA, etc. where Brand 1 measured the reading for up to a minute before it stopped injection of voltage & started exhaling smoke. Brand 2 on the other hand was unable to inject the voltage.



Megger passed this test with error free demonstration of S1-1068 on the same transformer connected with bus where a massive induction was observed with noise level close to 12.9 mA. It was the error free repeated reading a couple of times in such extreme conditions which helped the customer confidently award the tender in favour of Megger.

Key benefits of S1-Series :

- Wide Resistance Measurement range up to 35 Tera Ohm
- High Current - 6 mA short Circuit current for easy testing of highly capacitive specimen E.g. Cable, Power Transformer
- Excellent High noise immunity – 8 mA of noise rejection for fast, easy and accurate measurement of Insulation resistance
- Four software filters which helps to measure IR in noisily substation by averaging the results for the time period defined
- Guard terminal performance with less than 1 % error which gives most accurate results of the specimen
- The IR unit can operate wireless via. Bluetooth device and test any specimen with live trending. The results can be stored in data management software for ease of result analysis
- CATIV 600 V rating and 1000 V Protection between every test terminal, including the guard terminal

