

# RMU Protection Solutions for TPDDL, Delhi

By Ashida Electronics Pvt. Limited | Category: Most Innovative Supplier

Tata Power Delhi Distribution Limited (TPDDL) has a dense network of Ring Main Units (RMU) installed in the 11kV Distribution Section of Delhi. It protects the distribution network in most cases, but at times, it fails to detect the fault. ASHIDA implemented protection functions like the Broken Conductor Detector (46BC), Auto Recloser and the Negative Phase Sequence in their self-power relay.



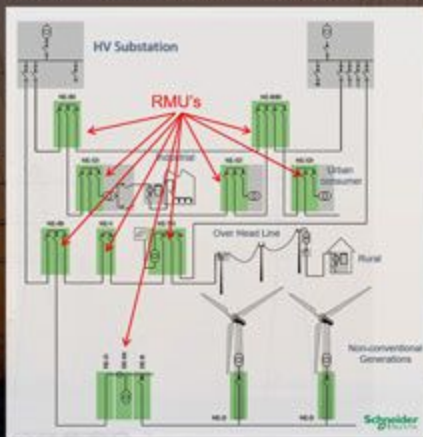
## The Innovation

ASHIDA introduced Broken Conductor Detection (46BC) function in its Self-Powered RMU Protection Relay Type ADR241S. ADR241S is now equipped with Broken conductor detection protection. Broken conductor condition can be detected by the ratio of Negative sequence current to Positive sequence current ( $I2/I1$ ). This will help to increase public safety for bare conductor's feeders running over paddy field or agricultural suburban area. New protection features had provided for highly resistive cable fault identification.

### A TYPICAL RMU NETWORK

- The Ring Main Unit (RMU) is small compact switchgear arranged in Ring.
- The advantage of Ring system is that speedy network isolation in case of fault.

ADR241S also provided with 4 shot Auto recloser function. Numbers of shots are selectable. There are 4 timers for auto recloser. Those are 1) Dead Time for shot 1 (DT1) 2) Dead Time for shot 2 (DT2) 3) Dead Time for shot 3 (DT3) 4) Dead Time for shot 4 (DT4) and 5) Reclaim Time (RT). If the fifth fault occurs during RT, Relay generates Lock-Out alarm and blocks further reclose. The Lock - Out condition can be reset locally as well as remotely by SCADA through communication digital status input. For each transient fault Auto Reclosing function shall be used in relay with 4 shots having dead time settable from range 0.1 to 180 second for each shot & selectable reclaim time 10 to 300 second. The circuit breaker can be monitored remotely through SCADA Communication. ADR241S is provided with IEC 60870-5-103 & MODBUS protocols. Thus, Auto Reclosing feature acts as self-curable and self-sustainable. All major international IDMT curves are available. The stages of Over Current, Earth Fault and Negative Sequence O/C function are programmable as per IDMT characteristic based on IEC and IEEE standards. Three stage protection for over current and earth fault help the utility for more precise relay coordinations.



## Overcoming Challenges

A feature like Broken Conductor Detection, Auto Reclosing, Negative Phase Sequence, disturbance recorder was customised on basis of the inputs of Tata Power DDL - Distribution Protection & Automation team for the first time in case of RMU Protection. Our Research & Development unit worked together with Tata Power DDL protection team and successfully implementing the said features in RMU Protection relay.

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of the  
Innovation

improved  
public  
safety

commercial impact  
negligible