



Role of Intelligent Substation Communication Gateway in Distribution Substation

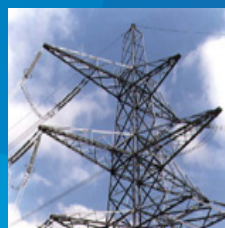
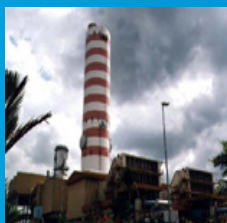
By:

G Krishnamurthy, Easun Reyrolle Limited



Role of Intelligent Sub Station Communication Gateway in Distribution Automation

In today's Volatile and rapidly changing Energy Markets Power Producers and other Clients are looking for Partners with Clear vision of future and imagination And High Business Standards required to make that Vision a Reality.



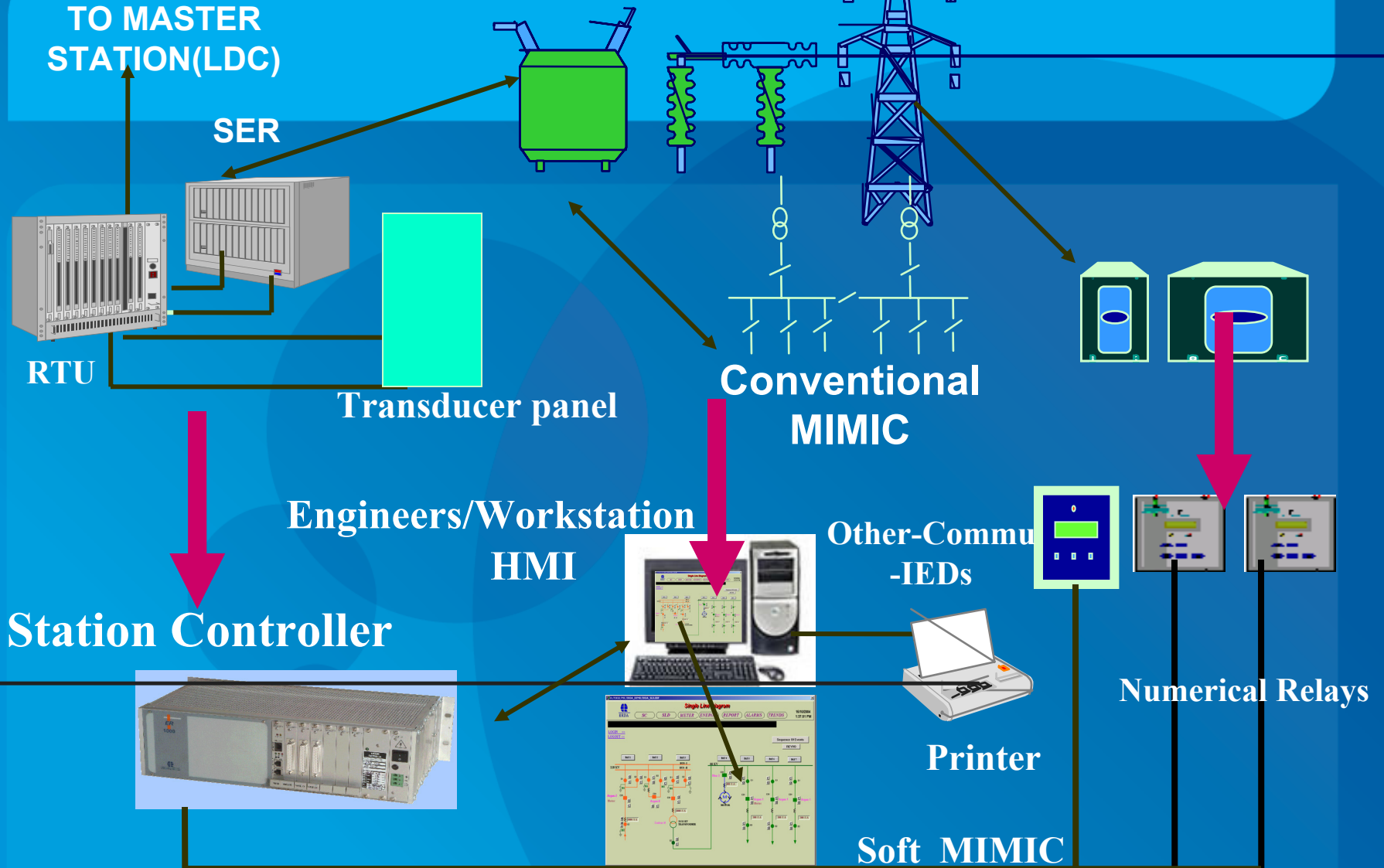
Transmission

Distribution

Industrial

COMPLETE AUTOMATION SOLUTION

Today's HV/MV SUBSTATIONS ARE NOT STATIC



Why Distribution Automation System

?????

Distribution System's
Productivity & Efficiency



Effective Management



Effective Management



Continuous Monitoring & Control to
Minimise Down Time & Ensure
Optimal Operating Conditions



Solution!!!!



Distribution Automation
System.

Prime Reasons → Increased Down Time / Poor Revenue / Poor Quality of Service etc.,

- Non Availability of Complete System Topology
- Current & Historical Status / Health Information of primary equipments of Distribution system (Viz. RMUs, BKRS, DT's etc.,)
- Non availability of remote Primary equipment controls (Condition Based Controls with Safety Interlocks) → Delayed service restoration.
- * Present the state and operational Details of the field equipment in a user friendly manner through a powerful GUI

Distribution Automation System's Expected Key Operational Functionalities !!!

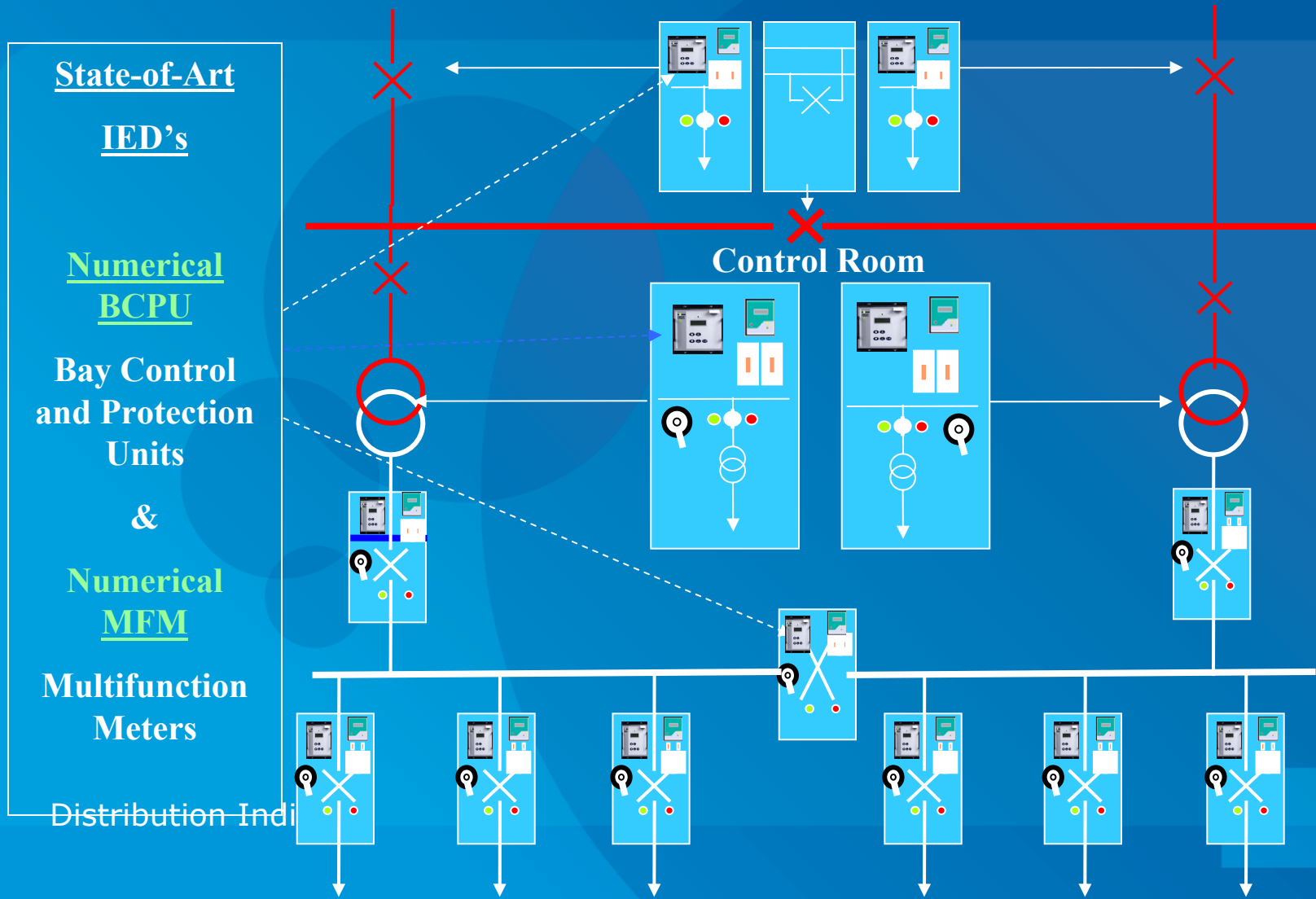
- * Monitor and Control the field equipment locally and remotely
- * Acquire Bay Level Data
- * Process the acquired Data in a computing system
- * Present the state and operational Details of the field equipment in a user friendly manner through a powerful GUI

Distribution Automation System's Specific Characteristics Expected !!!

- * Modular & Distributed Approach ---- Hence Easy for Trouble Shooting and Reduced Down Time
- * Comprehensive Diagnostic Tools ---- Hence Easy for Trouble Shooting and Reduced Down Time
- * Minimal Cabling and terminations---Hence Easy Maintenance and Lower Cost
- * Cost Effective
- * Caters to all the functionality expected from Power System Automation Hence Early Return on Investment

Technologies Answer → DA Requirements

State-of-the-art IED Approach



Distribution Automation Architecture →



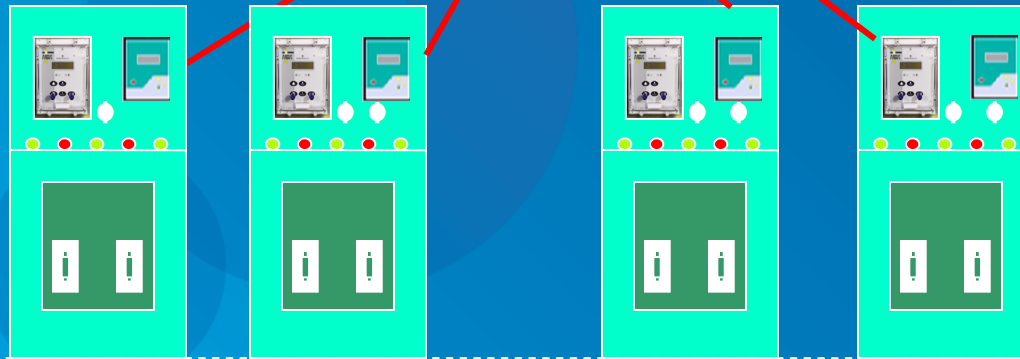
Control Room

ETHERNET LAN / WAN

SUBSTATION COMMUNICATION GATEWAY

Switchgear & Relay Room

Fiber Optic Cables



Switch yard

Distribution India 2

33 KV Line Feeder
11 / 33 KV Tfr

Benefits for Distribution Automation ! ! !

- Comprehensive information for operation
- Reduced outage duration
- Remote Monitoring and Control of Distribution System Operation
- Outage Management
- Load Management
- Condition Based Monitoring of Substation equipment based on the historical data on Devices
- Reduction in capital expenditure due to Effective utilization of substation facilities
- Improves the meter reading efficiency and accuracy
- Reduction in Operation and Maintenance Cost
- Availability of continuous data on loads etc.
- Determination of Load Patterns
- Detection of abnormal energy consumption pattern
- Reduction in Man power.
- Reduction in Manual intervention

Conclusion !!!

The effective utilization of the information from the Intelligent Electronic devices (Numerical Relay and Multi function Meters) through Communication gateway will help the utilities to operate their Distribution System efficiently and economically.

The best way of effective utilization of IEDs is to integrating the information of these devices.