From Chairman's Desk

The Firm **ELCON ENGINEERS** was established on December 20, 1982 as a Sole Proprietary Company with an intention to render Testing and Commissioning Services of Electrical Power Distribution System Equipment including Relay Testing as a Prime Activity. Subsequently the Services of providing Electrical System Design, Detail Engineering, Consultancy, Power System Study, Analysis and Solutions were rendered manually effective from 1986.

The Company converted to **ELCON ENGINEERS Private Limited** on December 20, 1998 with the **Industrial Plants** growth thus covering the software based services for Electrical field of Captive Generation, Sub-station and Distribution Network of Industrial Power System.

We are leading Power System Engineering and Consulting firm providing our expert services and a state of the art technology to our clients for past Three decades in the field of **Power System Study and Network Analysis** and **Power System Design Engineering and Consultancy.** We have worked on variety of systems worldwide. We have got overall exposure to work on

- System of voltage level up to 400kV
- System having a generating unit of capacity up to 600MW

We strongly believe following are our **Key to Success**

- Proven track record and vast global field experience
- Knowledge based structured organization
- Unique service mix and expertise on technical core of power system
- Extensive industry connection
- Enriched and advanced software base and infrastructure

Together, our **TEAM** shall be building Infrastructure critical to society – Infrastructure that must serve Industries well for decades with simplicity, quality, reliability, performance and perfection.

For meeting the challenges of advancement in study and design engineering including execution, we have expanded our Horizon and shortly moving to our corporate office at 501/2/3 Onyx Business Centre, Akshar Chowk, OP Road, Vadodara – 390020.

Sincerely,

ARVIND MEHTA
Chairman

Engineering for a Better Tomorrow

Power System Design Engineering Consultancy and Start up

For the Lender
- Lender's Engineer

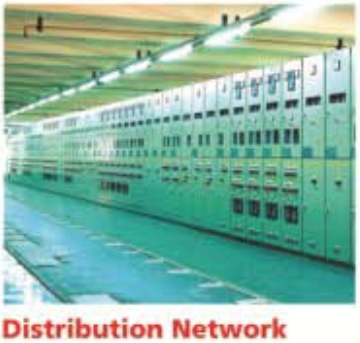
For the Owner
- Owner's Consultant

For the EPC Contractor
- Detailed engineering consultant

Pre-project activities
- System Studies
- Feasibility and Detailed project reports

Outdoor Switchyards, Captive Power Plants and Distribution Network
- Outdoor switchyards up to 220kV Electrical Civil and Structure
- Captive Power Plants
- Distribution Network

Captive Power Plant



Distribution Network

Outdoor Switchyards

Renewable Power
- Wind Power
- Solar Power

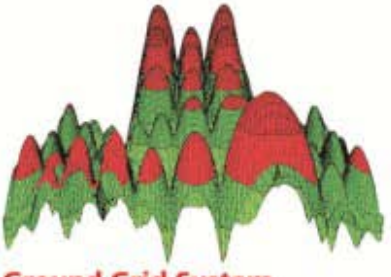
Design Engineering
- Basic studies/engineering
- Design calculations and drawings
- Enquiry specifications
- Technical bid analysis
- Vendor drawing review
- Electrical balance of plant

Commissioning Support
- Start-up and commissioning assistance
- Trouble shooting

Feasibility Study, Concept Design Reports and EPC Solutions
- On-site or off-site techno-commercial feasibility study
- Power hook-up arrangements
- Nuisance tripping problems
- Tripping of generator for grid side disturbances
- Power import and export schemes
- Power factor improvements

Rationalization of Electrical Systems for Reliability
Undertaking Electric Power System equipments and components study and analysis to remove unreasonable elements and to make rational to reason to ensure reliability

Ground Grid Design Assessment
- Calculation of maximum Ground Resistance Rg, Step and Touch potential, Maximum ground potential rise and Maximum Grid Current
- Deciding of appropriate size of earth conductor and nos. of earth electrodes
- Ground grid layout and typical earth-pit drawings
- 3D profiles illustrating Absolute potential, Touch potential and Step potential



Ground Grid System

Power System Study for Reliability

Power System Study Network Analysis Solutions on EPC Basis

Power System Simulator (using ETAP Simulator since 1994)

- Five nos. of licensed standalone keys of USB type
- Very soon upgrading with concurrent user network LAN
- Trained and experienced engineers working on ETAP
- ETAP solution provider in India registration - ETAP SP-10-27
- Simulation studies as per IEC /ANSI / IEEE standards

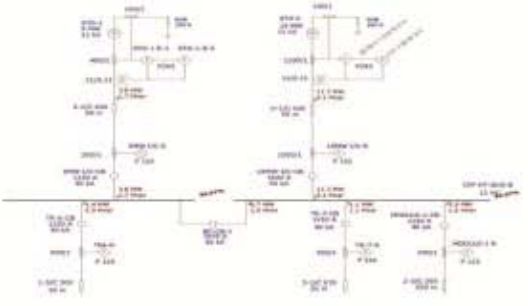
etap Thinking Power

SOLUTION PROVIDER

SP-10-27 REGISTERED

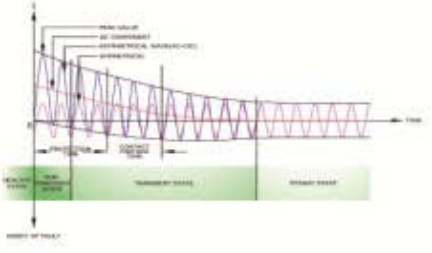
Load Flow Study

- MW and MVAR flow of power from and AMP flow and % P.F. of each branch
- Examination of load demand against generation
- Evaluation of equipment ratings and branch loading
- Voltage profile of the system and suggestions for transformer tap selection
- Best suited operating philosophy and Planning for future load expansions



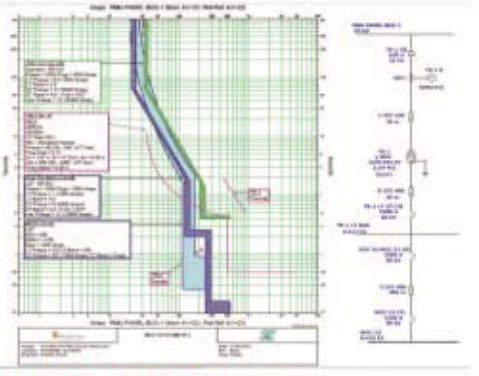
Short Circuit Analysis

- Device duty to examine / determine the switchgears short circuit ratings
- Examine breaking capacity or short time rating of circuit breaking devices
- Evaluate short circuit contribution from each source a nd branch of circuit
- Inputs to calculate protective device settings
- Suggestions for operating philosophy in view of fault level

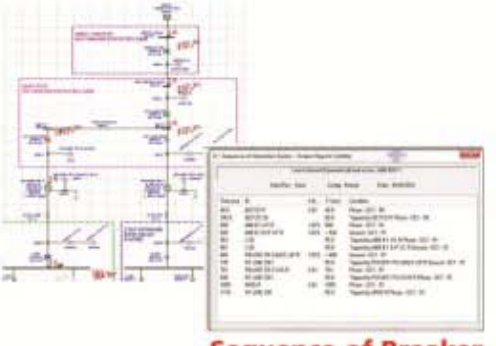


Protective Device Coordination Study

- Protective device coordination of relays / releases / MCCBs / Fuse
- Recommended relay settings and relay parameterization
- TCC plots along with respective electrical circuit with unique ID of all devices
- Simulations for circuit breaker sequence of operation



Coordination Curves



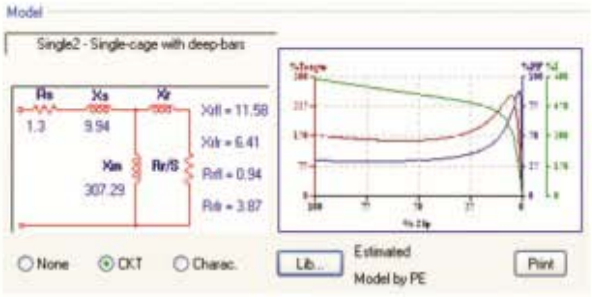
Sequence of Breaker Operation

Arc Flash Hazard Analysis

- Calculations based on IEEE - 1584 - Arcing Current, FCT, AFB, Incident energy
- Selection of PPE based on NFPA 70E - 2015
- Supplying of customized printed labels as per client's requirement
- Arc Flash Protective device coordination
- Energy Boundary Approach for system below MCC / PDB level
- Suggestion to mitigate the incident energy level, if above 40 Cal/cm²

Motor Starting and Acceleration Study

- Assessments of voltage dip during large DOL Motor Starting
- Evaluate safe loading on generators to successfully start the motor

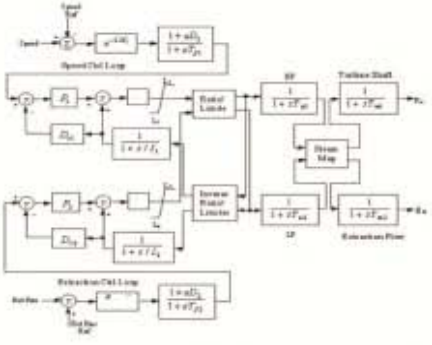


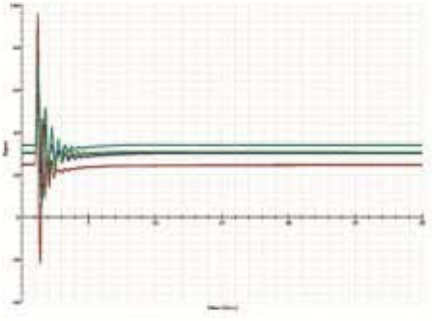
Review of Unit Protection

- Settings and Calculations for Generators, Power Transformers, Large Motors, Reactors, Long run cables and Large Capacitor banks

Transient Stability Analysis

- Rotor Angle Stability Analysis
- Evaluate critical clearing time (CCT) for generators for grid side faults
- Examination of re-acceleration of large motors post transients



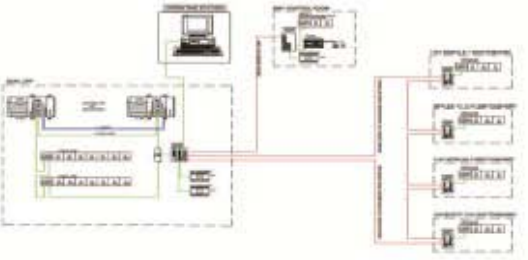


Grid Islanding Scheme

- Deciding of relevant grid islanding protections and appropriate multifunction relay
- Detailed engineering for Grid Islanding Scheme
- Calculation of protection settings and logic diagram
- Special Boolean logics to provide immunity to sensitive settings
- Engineering for AVR and Governor operation mode changeover scheme
- Engineering to initiate the load shedding scheme

Load Shedding Scheme

- Deciding of appropriate type of primary and back-up load shedding
- Open Loop Logic based / MW or Import Based / Under Frequency Based / Demand Based / PLC or Power Controllers Based / Real-time based Intelligent Load Shedding
- Dynamic load shedding scheme
- Deciding of priority load list mutually with client, scheme settings and logics
- Deriving total no. of DI/DO and AI/AO
- Comprehensive procurement specifications and BOM including spares and redundancy



Harmonic Measurement and Mitigation

- Complete measurement schedule for voltage and current
- Measurement up to 50th harmonics using 3-phase power logger of Fluke Make
- Summary report and suggestions for mitigation

Current and Voltage Harmonic Trend

Protection System Retrofit and Refurbishment

- Retrofit solution of electromechanical protective relays with numerical relays
- Selection of relay make, type and detailed model to suit the application
- Supply, configuration, installation, wiring, testing and commissioning of complete scheme
- Retrofit solution for Generators and Switchyard with control and relay panels

Power System Simulator

Our Valuable Clientele

ADITYA BIRLA NUVO

ADITYA BIRLA PT INDO BHARAT RAYON

ADITYA BIRLA GRASIM

ADITYA BIRLA UltraTech

ओएनजीसी ONGC

NAFAL CONTRACTING & TRADING CO.LLC

LARSEN & TOUBRO LIMITED
Engineering Construction & Contracts Division

SRF

LANCO
Always Inspiring

INDORAMA

AROMATICS OMAN LLC

IVRCL
IVRCL Infrastructures & Projects Ltd.

AARTI INDUSTRIES LIMITED

THERMAX

JIFCO

IFFCO

KRIBHCO

Schneider Electric

OMAN METHANOL COMPANY L.L.C.

SANGHI CEMENT

Ambuja Cement

JAI KISAAN
ZUARI INDUSTRIES LTD.

J.K. CEMENT
SARVASHAKTIMAN

EPSC

CHAMBAL FERTILIZERS AND CHEMICALS LTD.

GAIL (India) Limited

Oman Refineries and Petrochemicals Company LLC

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Ensuring Power System Reliability