

LEADERS IN ENGINEERING SOLUTIONS





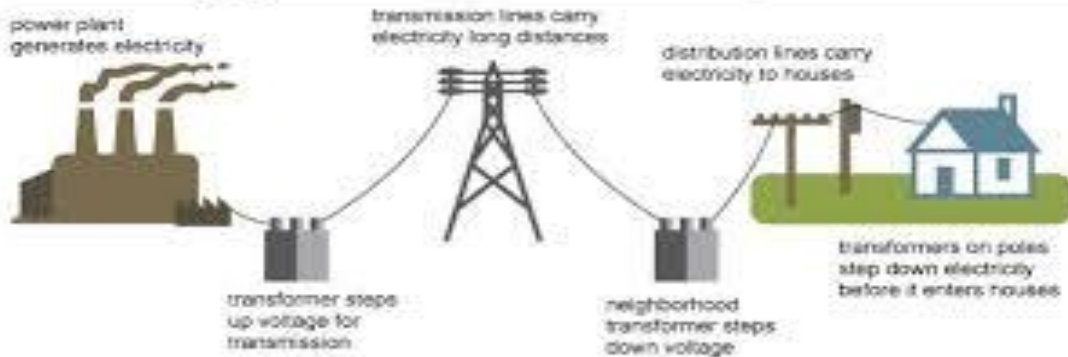
- ❑ **Matrix is an ISO 9001:2008 Certified Professionally managed Engineering Consultancy Company having Expertise in System Engineering to Detailed Engineering from conceptualization to successful commissioning**
- ❑ **About a decade of presence in various sectors of Power and other Heavy Industries**
- ❑ **Proficiency in Civil, Mechanical, Electrical and Instrumentation fields.**
- ❑ **Strong presence in Distribution & Transmission including Consultancy Services, Load Flow Analysis, Short Circuit Analysis, etc.**
- ❑ **Executed Prestigious Projects across the globe.**
- ❑ **Serving Customers' need with Global Presence and Strong Local Support**



Electric Energy – Scope of Services

- ❑ Power Generation
- ❑ Electrical Substations
- ❑ Transmission Lines
- ❑ Reactive Compensation Systems
- ❑ Industrial Applications
- ❑ Automation and Control
- ❑ Electrical Systems Analysis
- ❑ Site Supervision Services

Electricity generation, transmission, and distribution



Source: Adapted from National Energy Education Development Project (public domain)



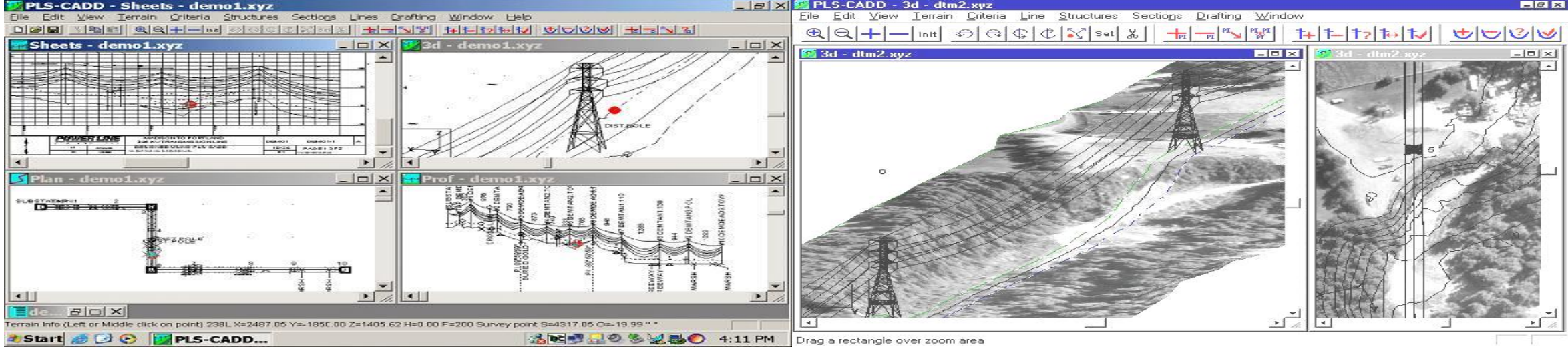
PLANNING AND DESIGN ENGINEERING

- ☐ Methodology of Data Collection by Client
- ☐ Analysis and Verification of the data collected, Electrical Network Modelling
- ☐ Power System Analysis - Load Flow Analysis, Reactive Power Compensation Requirement, Short Circuit Studies, Relay Coordination Studies, Transient Stability Studies
- ☐ Report Preparation for the Studies including Financial Impact
- ☐ Preparation of Design and Planning Manuals
- ☐ Preparation of Specifications of Equipment



SUBSTATIONS

- ☐ Civil site design
- ☐ Structural site design
- ☐ Architectural design
- ☐ Electromechanical design
- ☐ Lightning Protection design
- ☐ Earthing System design
- ☐ Backup Emergency power system design
- ☐ Primary Equipment layout and details design
- ☐ Secondary Equipment layout and details design including Protection
- ☐ Telecommunication and Scada Systems



POWER TRANSMISSION LINES

CIVIL BASIC STUDY & DETAILED ENGINEERING

- ☐ Design Basis & Criteria
- ☐ Tower Stadd Analysis
- ☐ Tower Foundation Design Calculation
- ☐ Tower Foundation Calculation
- ☐ Foundation drawings for all Types of Towers
- ☐ Power Line/Telecom Crossing drawings
- ☐ Civil BOQ



POWER TRANSMISSION LINES

ELECTRICAL BASIC STUDY & DETAILED ENGINEERING

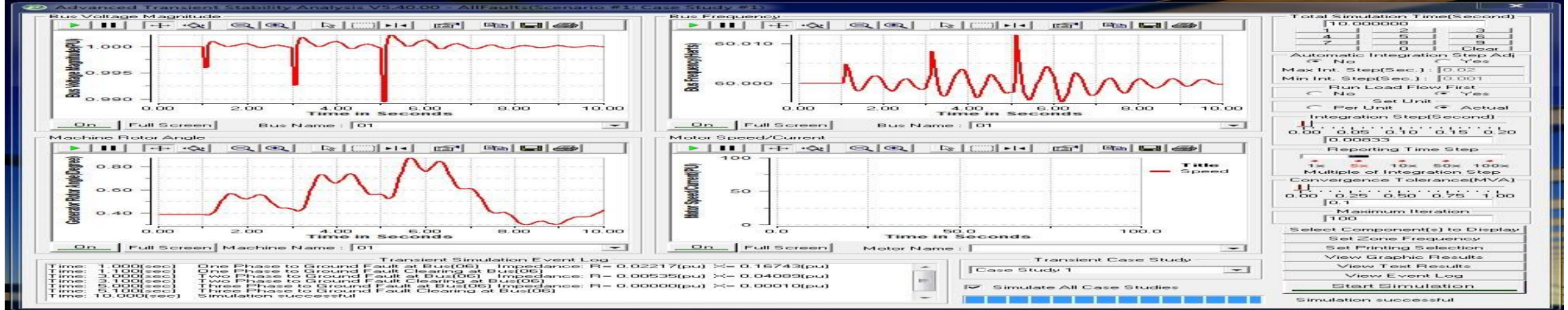
- ☐ Conductor Sizing
- ☐ Voltage Drop & Power Loss
- ☐ Earth Mat Design
- ☐ Insulator Cantilever Strength
- ☐ Sagging Calculation, Conductor Stress Calculation
- ☐ Shield Wire Stress Calculation & Shield Wire Size
- ☐ Tower Spotting, Force on Tower
- ☐ Plan & Elevation of Line
- ☐ Suspension Insulator, Strain Insulator, Suspension Hardware, Strain Hardware, Vibrator Damper, Parallel Groove and Tee Connectors, Miscellaneous accessories like Danger Plate, Circuit Plate, Anti-climbing Device, etc.
- ☐ Electrical BOQ



REACTIVE POWER COMPENSATION

Studies for the Definition & Design of Reactive Power Compensation Systems

- ❑ Static Var Compensators (SVC's)
- ❑ Flexible AC Control Systems (FACTS)
- ❑ Fixed Series Compensation Platforms
- ❑ Mechanically Switched Capacitors
- ❑ Shunt Reactors

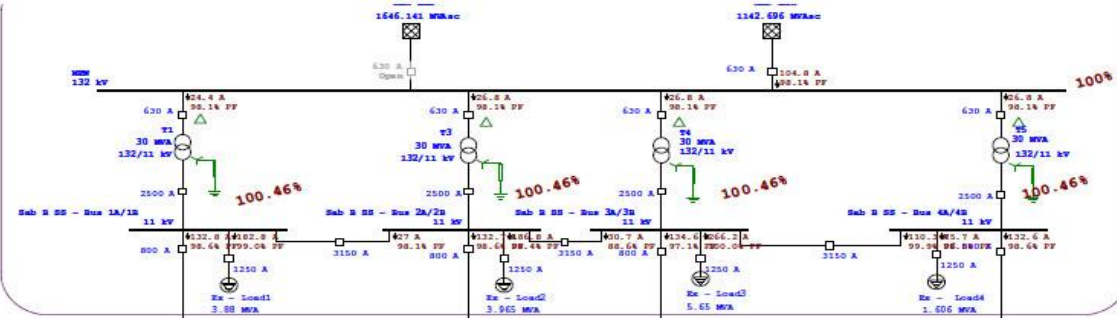


PLANNING & DESIGN CONSULTANCY SERVICES – MC FOR ELECTRICITY DISTRIBUTION & SUPPLY AUTHORITY, SIERRA LEONE (AFRICA)

Primary Contracting Company: Khatib & Alami, Beirut, Lebanon for EDSA, Freetown, Sierra Leone

Duration: 30 Months

- ☐ To identify the areas of Design & Planning including Forecasting, Analysis and Feasibility
- ☐ Reduce Losses in Electricity Supply in Freetown Capital Western Area
- ☐ Improve Commercial Performance of the EDSA
- ☐ Increase access to Electricity in selected rural areas
- ☐ Load Flow Analysis and Short Circuit Analysis
- ☐ Supply of Design and Planning Manuals as defined under deliverables
- ☐ Automation and Smart Metering for existing Substations
- ☐ Design & Engineering of new Substations, Transmission Towers, etc.
- ☐ Future Power Generation Scenarios and Forecasting



CONSULTANCY SERVICES FOR ELECTRICITY PLANNING – QATAR GENERAL ELECTRICITY & WATER CORPORATION

Primary Contracting Company: Khatib & Alami, Doha, Qatar for KAHRAMAA, DOHA

Duration: 36 Months (In-Progress)

- ☐ Carry out Network Study works in KAHRAMAA Electricity Network and make necessary provision for power supply for each and every Building Permit Application and other required work places as per KAHRAMAA Electricity Network and Planning Department requirement.
- ☐ Carry out detailed Substations wise study of existing Distribution Network and make necessary reinforcement proposals.
- ☐ Study to carry out required Infrastructure Development Schemes to cover complete area in line with ASHGHAL (as part of LR&DP) requirement.
- ☐ To carry out Field Study and make proposals to underground existing Cables and Overhead Lines in co-ordination with all KAHRAMAA concerned departments.
- ☐ Prepare proposals for relocation of Distribution Substations which are existing in the middle of the roads etc. in co-ordination with MMUP, ASHGHAL and KM Civil Unit.
- ☐ Scope of work in the areas of Distribution Planning, Transmission Planning, Forecasting & Network Planning, Design & Development, Material Standard Specifications & Inspection, etc.