

## ELECTRICAL SAFETY AUDIT SERVICES

Utilities, Facilities, Industries, Commercial Establishments FMCG,  
Textile, Process and Plants



# SACHU TECHNOLOGIES

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**Branches:** BANGALORE, CHENNAI, PUNE, VISAKHAPATNAM, VIJAYAWADA, MUMBAI, DELHI

**SACHU TECHNOLOGIES** offering Electrical Safety Audit including Power Quality study, Thermography Survey, Earth Resistance Measurement and IR Insulation Resistance Measurement and others get to the root of the problem, identifying grounding errors, Hot spots, poor connections, Abnormalities, harmonic distortions and other issues that may be reducing the quality and reliability of your power system to avoid Dips, spikes, surges, momentary outages short circuits and Fire accidents.

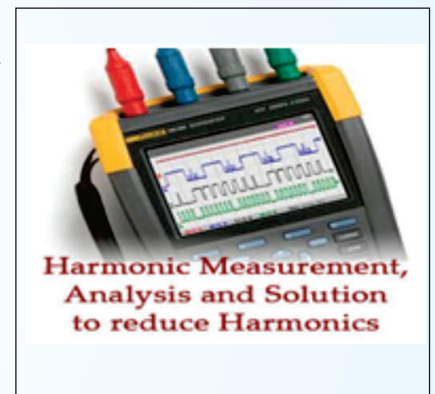
**Electrical Safety Audit** Electrical Safety Audit has become crucial to the proper maintenance of the facility. In addition, rising fuel costs coupled with increased global competition is forcing industries/buildings and other facilities to slash energy costs. Electrical Safety Audit is conducted to investigate if complaints and concerns by workers regarding electrical safety is substantiated and if there are other electrical safety or general safety hazards at the facility that should be addressed. The audit focus on current electrical safety conditions, and selected other safety measures for the facility.

### **Electrical Safety Audit (objective)**

To present the current status of the facility before the top management, such that better monitoring is possible in future. Diagnose Various on-going losses in the facility, Recommend Measures for Improvement and Electrical Safety.

## **Power Quality Analysis & Harmonics study Measurement Functions**

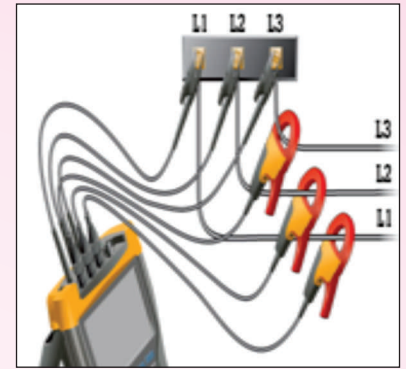
- The RMS values of AC voltages up to 1000 V between terminals. By using the ratios, the device can measure voltages up to hundreds of gigavolts.
- The RMS values of AC currents up to 10,000 amperes.
- The DC components of voltages and currents.
- Minimum and maximum half-cycle RMS voltage and current values
- Peak voltage and current values, The frequency of 50 Hz and 60 Hz networks.
- Current and voltage peak factors (excluding neutral current).
- Calculation of the harmonic loss factor (FHL),
- Calculation of the K factor (KF)
- Measurement of total harmonic distortion with respect to the fundamental
- Measurement of the total harmonic distortion with respect to the RMS AC value
- Active, reactive (capacitive and inductive), non-active, distortion, and apparent power, by phase and cumulative.  
Power factor (PF) and displacement factor
- Measurement of the RMS distortion value (d) for the current and the
- Short-term voltage flicker (PST).
- Active, reactive (capacitive and inductive), non-active, distortion, and apparent energy.
- Current (excluding neutral current) and voltage harmonics up to order 50
- Apparent harmonic power up to order 50: percentages referred to the fundamental apparent power (%f) or the total apparent power (%r), minimum and maximum of a rank
- Calculation of the RMS neutral current from the currents measured on the phases of a three-phase system, Load flow Analysis





## Benefits of Power Quality Study

- Assist in preventative and predictive maintenance,
- Identify source and frequency of events
- Establish precise location and timing of events
- Develop maintenance schedules
- Monitor and trend conditions,
- Analyze harmonics, Flicker
- Transients frequency variation, voltage variations (sag & swell .)
- Ensure equipment performance, Assess sensitivity of process equipment to disturbances



## Thermography Inspection

To prevent Fire Accidents and an Early detection of Short circuits( What is Thermography) means Extreme heat in any system components is indication of potential equipment failure. Overheating components can cause problems that can lead to expensive or even catastrophic failures resulting costly down time. How Reduce Down time and save huge money using Latest Infrared Thermal imaging camera can accurately measure the Temperature locate the anomalies that threaten Employee safety and reliability of your system components. By scheduling repairs before a failure occurs profitability, productivity, and work place safety are all increased

## Thermography scanning objects to be checked list

- ❖ Electrical Panels, Power distribution , Transformers power input , out put terminals and bushings
- ❖ Switch yard 750KV/400KV/220KV/66KV/33KV/11 KV/440V including CT, PT and Breakers
- ❖ Switchgear components, Control Panels, MCC, PLC, Main Incomer, Substations, HRC Fuses, Clips, switches ,Connectors, Bus bar system, Bolted connections and Bus bar Trucking system
- ❖ Capacitor Banks , Battery Banks ,Diesel Generator input and output connections
- ❖ ELCB, Switches, Isolators, Lift power cables , Generator power input and output terminals, Contactors, MCB's, ACB, VCB, MPCB, MCCB and LT Cables
- ❖ Broken/Undersized Wires ,Energy meter input and output terminal
- ❖ UPS, Inverter, Loose and Poor connections, Unbalanced loads
- ❖ Bus Ducts and Cable Drops, Electrical Cabinets, Data Centers
- ❖ Thermovision Hotspot Scanning for Over headlines, Transmission Line Towers
- ❖ Thermography also useful in Mechanical, Motors, Refractory, Building and other Segments

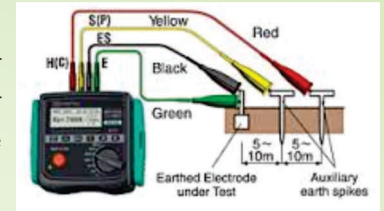
## Benefits of Thermography Study

- Safety: Failure of Electrical / Mechanical / other industry components leads to production losses, accidents, serious hotspots leads yet killing people, employees or public
- Reduced outage costs, Increased production in industry, Profit increase,
- Green Environment Establishment, Reducing Energy Consumption
- Prevent loss of production, Extend equipment life, Maximize Maintenance efforts
- Set baselines on new equipment Installations



## Earthing Audit

Revision the earthing system of a facility or Industry and check compliance to set standard or defined industry requirements. Study and inspect the current earthing system to check its function ability. Identify requirements to upgrade the system or make it fail safe as per future expansion devices.



## Benefits of Earthing Audit

- Understand function ability of the existing Earthing system.
- Suggest changes if any to enhance it's reliability.
- Define changes to accommodate future load expansion.

## Insulation Resistance Measurement

Insulation resistance testing is commonly performed as part of electrical testing in a preventive maintenance program for rotating machines, cables, switches, transformers, and electrical machinery where insulating integrity is needed. Insulation resistance testing in the preventive maintenance program helps identify potential electrical issues to reduce unpredictable, premature equipment repair and replacement cost Electrical resistance of an insulating material between a pair of contacts, conductors, or grounding devices that is determined under specified environmental and electrical conditions. The polarization index is defined as the ratio of the 10 minute resistance value to the 1 minute resistance value



## Electrical Audit Scope of Work

Program start-up & orientation (site), Onsite Assessment (site), Data collection from various location (Site), Final report preparation (Office), Submission & Presentation of report, (Site), Electrical audit shall be carried out to specifically cover the following aspects.

Physical inspection of the Building /office/Factory premises with reference to applicable standards codes of Practice & identifying electrical hazards (shocks, fires, etc.). Review of protection devices / system of the electrical installation including fuses, ELCB, MCB, MCCB, Isolators master electrical switch, etc.

Review of adequacy of cables, motors, etc. based on actual load current measurements and cable current carrying capacities. To evaluate the earthing system, upkeep and testing of earth pits and to suggest recommendations Display of danger notices Use of electrical rubber mats, rubber gloves, etc. Provision of identification tag of cables, cable glands, sealing of cable entry and unused holes Provision of indicating lamps on the control panels Use of 3-pin plug and socket Fire protection of electrical installations Adequacy of isolation of current carrying parts Lightning protection, Cables-dressing, routing, identification tags, glands, lugs, armoured earthing, sealing of cable entry and used holes, adequacy for current carrying capacity, UPS and battery room

## Power Quality Analysis, Harmonic Study and Thermography Software

Software allows configuration, transfers, processing and analysis.

## Electrical Safety Audit Reporting

Detail Electric Audit with Audit observations (High critical, Medium critical & Low Critical) and summary

