



INDEPENDENT TECHNICAL ASSESSMENT

SOLAR PV AUDIT & INSPECTION

Assess. Identify. Optimize.

Helping businesses understand the condition, safety and performance of their existing solar PV systems.

Esperto Engineers delivers structured site inspections, instrument-based checks and practical recommendations for industrial and commercial solar installations across Pakistan.

IDENTIFY

Potential faults, abnormal heating and safety concerns.

ASSESS

Electrical readings and generation data in context.

IMPROVE

Prioritized corrective actions and maintenance planning.

● Independent assessment ● Instrument-based checks ● Safety-first procedures ● Actionable reporting

INDUSTRIAL • COMMERCIAL • ROOFTOP SOLAR

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Audit Scope

The inspection scope is agreed before the visit and tailored to plant capacity, equipment, accessibility and client priorities.

01 PV MODULES & STRUCTURE

- Visual check for visible cracks, damage, discoloration and soiling.
- Review of shading, mounting clamps, fasteners and accessible structure.
- Observation of delamination, backsheet and frame condition.
- Check of junction boxes and module labelling.

02 DC SYSTEM & STRINGS

- Selected string voltage/current measurements where safe and accessible.
- Visual check of cables, connectors, polarity and insulation condition.
- Review of cable routing, UV exposure and connector condition.
- DCDB / combiner box contents, fuses and protection devices.

03 INVERTERS & AC SYSTEM

- Review of alarms, fault history, operating parameters and generation.
- Inspection of ACDB/DCDB, breakers, isolators and cable terminations.
- Ventilation, cooling and enclosure condition.
- Display, communication and grid-connection status.

04 THERMAL INSPECTION

- Screening for abnormal heating at accessible modules and connections.
- Thermal observations documented with location and photographic evidence.
- Terminations in panels and breakers where accessible.
- Temperature comparison against neighbouring components.

05 EARTHING & PROTECTION

- Visual check of earthing conductors, bonding and surge protection.
- Earth resistance testing when included in scope and test access permits.
- Bonding of structure and equipment frames.
- Review of surge / lightning protection arrangement.

06 PERFORMANCE REVIEW

- Irradiance and module-temperature readings, where applicable.
- Generation data review and identification of potential loss factors.
- Comparison of reported and expected output where data exists.
- Review of monitoring and data-logging set-up.

Scope note:

Specialized I-V curve tracing, detailed power-quality/harmonics analysis, comprehensive earthing tests and laboratory module testing are separate services unless specifically included in the agreed scope.

Typical Audit Instruments

Instrument selection depends on the site, system voltage, test objective and safe access. Equipment shown is illustrative; exact models may vary.



PROFESSIONAL-GRADE TESTING EQUIPMENT

AC/DC CLAMP METER

AC/DC current, voltage and selected electrical checks.

PV INSULATION TESTER

Insulation resistance testing using suitable procedures.

IRRADIANCE METER

Solar irradiance and, where supported, module temperature.

THERMAL CAMERA

Thermal screening for hotspots and abnormal heating.

DIGITAL MULTIMETER

Voltage, continuity and resistance checks.

SAFETY ACCESSORIES

Rated leads, PPE, lockout/tagout and insulated tools.

WHAT AN AUDIT HELPS UNCOVER

Hotspots

Cracked modules

Loose terminations

String mismatch

Soiling & shading

Earthing gaps

Inverter faults

Cable damage

WHY AUDIT YOUR SOLAR SYSTEM?

● Detect issues

Find faults and potential safety risks.

● Reduce losses

Identify issues that may limit generation.

● Plan maintenance

Prioritize actions by risk and urgency.

● Support decisions

Use documented findings to plan repairs.

Our Audit Process

01

Initial assessment

Review system details, drawings and available generation data.

02

Site inspection

Visual and physical checks of accessible equipment.

03

Instrument testing

Agreed electrical, insulation, irradiance and thermal checks.

04

Technical analysis

Compare findings with available specifications and operating data.

05

Audit report

Document observations, evidence, risks and recommendations.

06

Follow-up support

Clarify findings and quote separately for corrective work if requested.

WHAT YOU RECEIVE

- Executive summary and plant details
- Inspection findings and test measurements
- Photographic evidence of significant observations
- Identified issues with risk/priority classification
- Prioritized corrective action recommendations

Clear, actionable reporting

A practical report for management, facility teams and maintenance planning — with findings ranked by risk and urgency so decisions are easy to make.

REFERENCE FRAMEWORKS

IEC 62446-1

Testing and documentation of grid-connected PV systems.

IEC 61724

Photovoltaic system performance monitoring.

IEC 62548

PV array design requirements.

Important: Audit conclusions reflect the conditions and access available during inspection. Energy savings are not guaranteed. Repairs, replacements, cleaning and specialized tests are excluded unless agreed in writing. Standards are listed as reference frameworks only and do not imply certification.

SCHEDULE YOUR SOLAR AUDIT

Contact Esperto Engineers to discuss your site and audit requirements.
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