# EPSA
## electrical power system audit
for mission critical facilities

PROTASIS
engineering & consulting
*with power, we perform*

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## What is EPSA?

**The Electrical Power System Audit (EPSA),** provided by **PROTASIS**, checks and evaluates power systems in terms of operation reliability, efficiency and safety. It is applicable in **Mission Critical Facilities** such as Heavy Industries, Oil, Gas and Petrochemical plants, Data centers and other critical infrastructure.

**EPSA** is an essential diagnostic tool for the Operation and Maintenance (O&M) engineers of industrial clients, who frequently face the consequences of an aging network, such as:

- Unexpected outages
- Loss of production
- Increased energy costs
- Unsafe workplace
- Obsolete equipment
- Disagreement with modern practices and standards

*with power, we perform*

**EPSA** mandates that **PROTASIS** Engineers perform an on-site proactive diagnostic quality audit which:

- **Examines** and assesses the security of system operation and equipment condition
- **Identifies** critical failure points, potential risks and problematic areas of the system
- **Marks** areas of the electrical system that can be improved, for its effective maintenance and secure operation

EPSA ultimately determines the overall "health" and integrity of power infrastructure, allowing PROTASIS to provide industrial clients with the best practice solutions for their facilities.

## Why EPSA?

EPSA will provide an independent, third-party evaluation and condition assessment of your electrical power system.

**The main reasons of problems with electrical power systems are:**

- Changes in the network topology or operating conditions (e.g. addition of new loads, new generation, increase of the short circuit level, new operating scenarios, etc.)
- Aging power/protection/control equipment
- Misapplications or deficient design
- Human factor (e.g. errors or weaknesses in the way that the electrical system is being operated or maintained)
- Undetected issues that remain “silent” until the actual occurrence of a fault/event

The objective of O&M engineers is to ensure that the electrical power system always operates at an optimum level, in terms of reliability and safety. Towards this direction, **EPSA** can be utilised to investigate the system integrity, to identify existing or potential future problems and to recommend solutions for system performance improvement and cost saving.

**EPSA** is being applied successfully in various facilities worldwide for more than ten years, demonstrating significant benefits for the end-user. The identification of findings and the adoption of recommendations deduced by **EPSA**, leads to significant cost-benefits for the client and it eliminates its cost in a rather short period of time!

**PROTASIS - EPSA** provides detailed information on the operational status, condition and capabilities of critical components in the power network such as:

## PRIMARY EQUIPMENT

- HV Disconnecting & Earthing Switches
- HV Busbars
- HV Lightning Arresters
- HV Voltage & Current Transformers
- HV Circuit Breakers
- HV Gas Insulated Switchgears
- HV Insulators
- Power Transformers
- MV Switchgears & Busbars
- MV cables
- Grounding Grid

## SECONDARY EQUIPMENT

- Protection relays
- Meters, Annunciators & Fault Recording Systems
- Electrical Network Automation & Control Systems
- Power Management & SCADA Systems
- Auxiliary DC/AC Systems
- Batteries & Battery Chargers

## PROTASIS' approach in EPSA includes:

- Site survey and visual inspections of primary and secondary equipment
- Collection of necessary data
- Review of plant operation philosophy
- Analysis of collected data and technical documentation
- Detailed reporting with findings
- Remediation recommendations and action plan in priority order

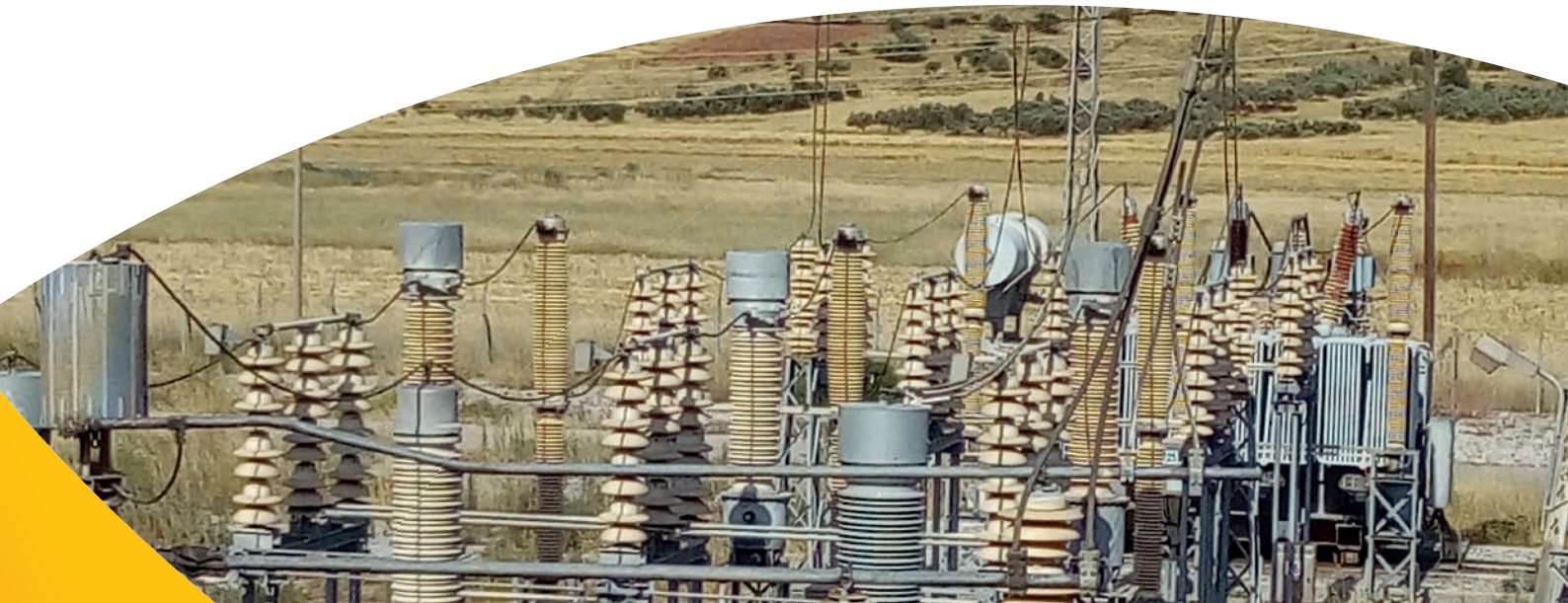

## EPSA Scope

**PROTASIS EPSA** aims to provide an overall assessment of the electrical power system integrity by thoroughly investigating one or more segments of the plant's electrical network.
The use of our gap-analysis form emphasizes and confirms the compliance with applicable international standards and industrial best practices.

More specifically, **PROTASIS EPSA** is developed through the following steps:

### 1. Site Survey

- Meeting and interview with the client's O&M personnel to let our experts get familiar with the particularities of the electrical installation
- Site-walk throughout the installation, to visually inspect primary and secondary equipment
- Detailed data collection, including existing engineering documentation (i.e. single-line diagrams, previous studies, schematic drawings, equipment datasheets, recent test reports etc.), network equipment nameplate data, load profiles and event recordings
- Retrieval of configuration settings and oscillographic recordings from protection relays, where applicable
- Sampled primary or secondary equipment tests, if requested



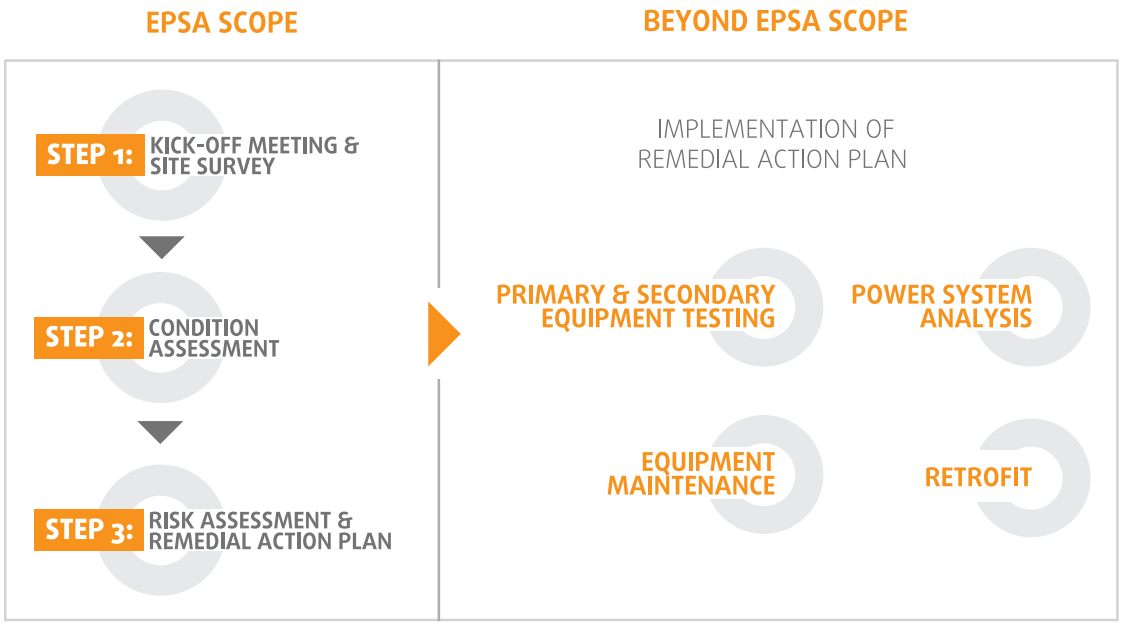
## 2. Condition Assessment

- Examination of the consistency and adequacy of the existing documentation
- Protection scheme assessment, based on available drawings and protection relays' configuration
- Condition assessment of power network components, based on collected information
- Analysis of specific incidents, if event recordings are available
- Reliability and redundancy assessment of auxiliary supply system
- Assessment of data network & SCADA system
- Evaluation of findings

## 3. Audit Reporting

- Detailed executive summary
- Presentation of findings
- Risk assessment of potential hazards and prioritization of findings
- Recommended remedial action plan

The previous steps are clearly depicted on the following flowchart:



## EPSA Benefits

**EPSA** benefits for industrial clients, include but are not limited to:

- The better understanding of the electrical power system by the personnel
- The personnel's awareness of the installation's undetected aspects
- The evaluation of the existing philosophy of the electrical power system and the identification of any possible need for change
- The realization of potential weaknesses and probable threats in the electrical power system
- The deep understanding of limitations of the electrical power system
- The assessment of the remaining life of the electrical power system elements
- The fine-tuning of the electrical power system operation
- Insights to the investigation of incidents, events, faults
- The provision of full support for network planning purposes and recommendations on future upgrades, improvements, expansions and/or major changes in network topology
- The efficient operation of your systems, leading to increased savings that exceed the cost of EPSA services!

To get a tailor-made **EPSA** quotation for your plant needs, send your inquiry to **epsa@protasis.net.gr** and our power systems experts will contact you promptly.

**Headquarters**
59B Apostolopoulou st
15231 Chalandri, Athens, Greece
+30 210 9561 154
**www.protasis.net.gr**