

CERDA

TESTING LABORATORY

Independent Testing Laboratory
for High Voltage Equipment



CHALLENGING ENVIRONMENT

The primary concern for utilities is to ensure grid reliability, efficiency, and security. As the grid evolves and load profiles change, increasing loads and abnormal conditions are stressing transmission and distribution networks, making grid management much challenging.

GLOBAL TRENDS IMPACTING THE GRID

Rising energy demand and integration of renewables

Changes in generation mix & decrease in conventional generation

Increased distributed generation with complex grid meshing

Environmental changes and extreme weather conditions

Regulatory policy changes

GRID CHALLENGES

Growth of power systems in size and complexity

Development of new Direct Current (DC) systems and equipment

Increase of short circuit current levels flowing in case of faults

Higher of voltage levels for longer transmission distances

Requirements to decrease the environmental impact of products and substations

This situation is impacting the reliability of the grid and the electrical components in substations, which now need to absorb higher stresses than they were originally designed for. This can lead to a shorter product life cycle and higher total cost of ownership.

CERDA Testing Laboratory is enabling manufacturers and end users to test their primary equipment by leveraging deep domain expertise and enormous testing facilities to develop enhanced high voltage products and certify their capabilities before market introductions.

View of a High Voltage substation



CERDA - CERTIFIED & INDEPENDENT

85 YEARS OF EXPERIENCE

CERDA is proven testing laboratory performing development and validation tests on high voltage switchgear in accordance with national and international standards. It is located in Villeurbanne, close to Lyon in France, and was established in 1929.

CERDA Testing Laboratory and General Electric (GE) share the same site. It allows proximity and partnership for research and engineering of new equipment or special solutions. CERDA is a fully confidential and independent institute.

ENSURING QUALITY

CERDA is accredited by COFRAC, the French certification committee and therefore, it can perform internationally recognized type tests report covered by accreditation of COFRAC for the tested equipment according to ISO/IEC 17025.



OUR MISSION

CERDA provides reliable and powerful testing facilities to high voltage and high current equipment manufacturers for the research and development of new products.

CERDA also ensures product performances with type test reports and certificates required by utilities for the installation of high voltage switchgear.

THIRD PARTY CERTIFICATION BY ASEFA

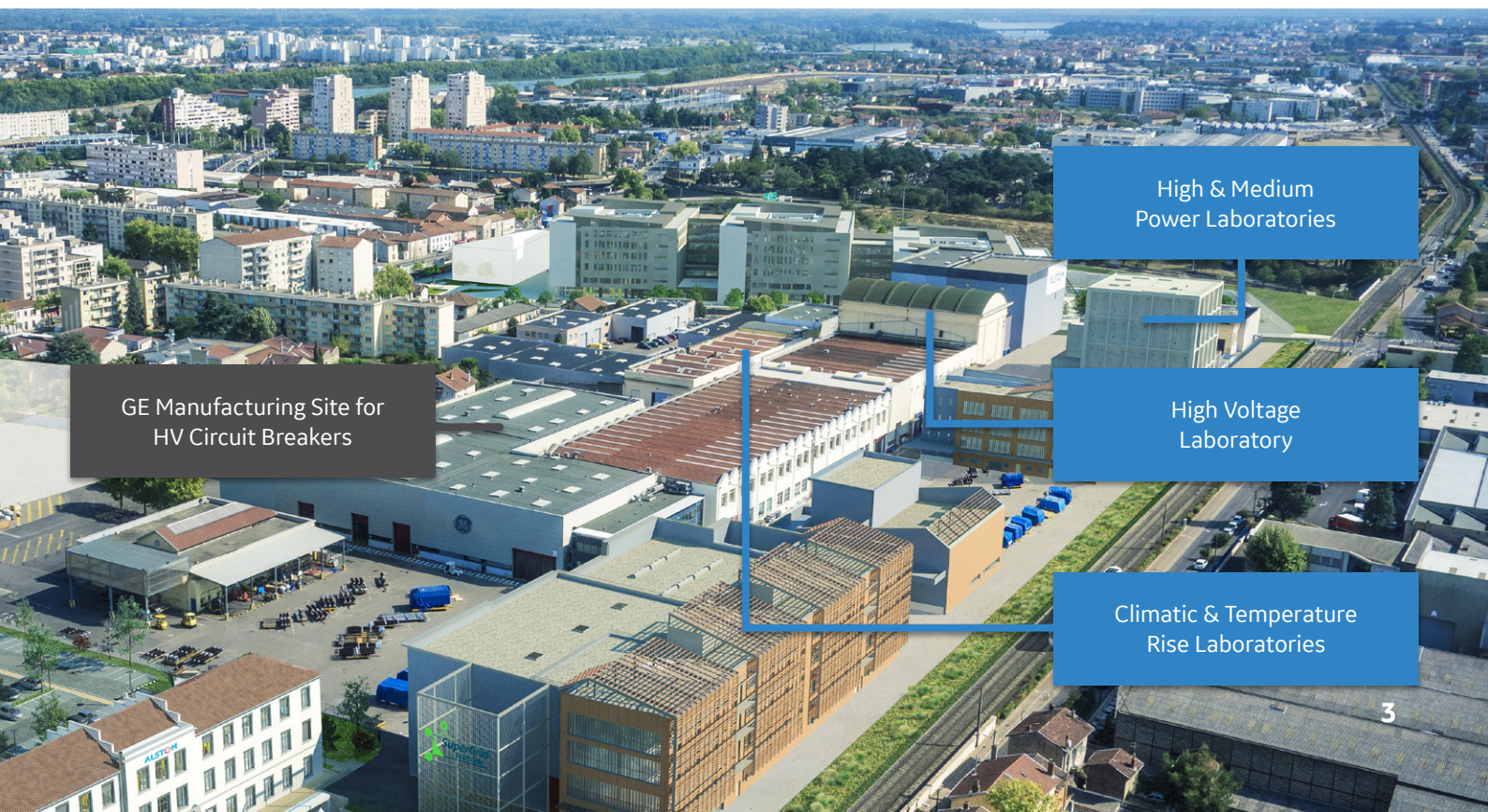
CERDA is also one of the high and medium voltage test laboratories recognized by the French product certification organization called ASEFA. Hence, it can provide a full ASEFA certification with an inspector.



NEUTRALITY AND IMPARTIALITY

As a member of ESEF and STL (Short circuit Testing Liaison), national and international associations for high power testing laboratories, CERDA ensures that all tests are carried out with full neutrality and impartiality. CERDA is a founding member of STL since 1970.

Tests are performed according to IEC, IEEE, EN, VDE, GOST, FURNAS, GB, DL and other standards or customer specifications.



PRODUCT & DOCUMENTATION OVERVIEW

SUPPORTING A WIDE RANGE OF HV EQUIPMENT

CERDA provides extensive testing facilities for the development and validation of high voltage equipment, such as:

- Live tank and dead tank circuit breakers
- Generator circuit breakers
- Gas-insulated switchgear
- Disconnectors & earthing switches
- Power transformers
- Instrument transformers
- Resistors and capacitors
- Surge arresters
- Cables & power connectors
- Other equipment possible on request

DELIVERING RESULTS & SUPERVISION

CERDA delivers COFRAC type test reports covered by COFRAC accreditation to demonstrate a performance according to international standards.

CERDA provides ASEFA certification for products according to international standards, including third party inspection. This certification is required by transmission & distribution end users.

CERDA issues investigation test summaries, necessary to support the improvement and development of existing or new products.

FLEXIBILITY

The CERDA laboratory can work in single or double shift, ensuring flexibility to clients' needs. Our technical experts are available for consultation and advice about the latest standards, methods and testing procedures.

Part of sparke gap



TESTING PORTFOLIO

TESTING FACILITIES

High power test laboratory for short circuit currents making and breaking tests.

Medium power station is an optimized alternative for short-time withstand current and peak withstand current testing.

High voltage test laboratory allowing full dielectric tests in AC, DC and impulses.

Two independent **temperature rise test laboratories** for the measure of products internal temperatures at nominal current.

Mechanical and **climatic tests** reproducing extreme environments.

Surge arresters test laboratory completes the installation.

VALUE ADDED SERVICES

Consulting & technical advisory

Logistics, assembly, gas handling and operational assistance

Gas mixture management including SF₆, CF₄, N₂ and g³

Gas analysis with material lab

Mechanical endurance assets

Decontamination

Destruction after tests

Decontamination at work



HIGH POWER TESTING

The high power test laboratory at CERDA provides comprehensive short circuit test programs according to international and regional standards and is equipped with modern and reliable measurement tools.

The high power laboratory is equipped with two short circuit generators rated at 2,500 MVA each, that can be coupled in parallel to reach 5,000 MVA. It can be associated also with the synthetic laboratory, which is able to simulate transient recovery voltages (TRV) up to 1,000 kV. Depending on the configurations this laboratory can run two tests simultaneously.

TESTING PORTFOLIO

Basic short circuit test duties

- Full pole 420 kV / 63 kA / 50 Hz
- Half pole 550 kV / 63 kA / 50 Hz

Short line fault tests duties

- Artificial line simulation up to 63 kA

Capacitive current switching tests

- 420 kV / 63 kA / 50 Hz full pole

Out of phase making & breaking tests

- 300 kV full pole
- 420 kV and higher in half pole

Internal arc tests up to 63 kA

Commutation switching tests in DC

Power supply di/dt measurement using Rogowski coils

Arc voltage measurement tests

TECHNICAL CAPABILITIES

Maximum generator output

- 2 x 2,500 MVA

Maximum short-circuit current (single)

- 100 kA

Maximum voltage for synthetic tests

- 1,000 kV

Frequency

- 50/60 Hz

3 x Testing Halls

Top view of High Power Test Laboratory Synthetic lab. Capacitor bank (left) and reactor bank (center, white)



MEDIUM POWER TESTING

The medium power station is equipped with two transformers rated 23 MVA each, and they can reach up to 46 MVA in combination. This laboratory is able to perform tests from 10 V to 850 V and up to 4,000 A, when coupled with one regulator transformer.

TESTING PORTFOLIO

Short time current withstand up to 80 kA rms for 3 seconds and 160 kAp

Disconnecter busbar transfer current up to 4,000 A

Earthing switch breaking and making of inductive currents

TECHNICAL CAPABILITIES

Transformers

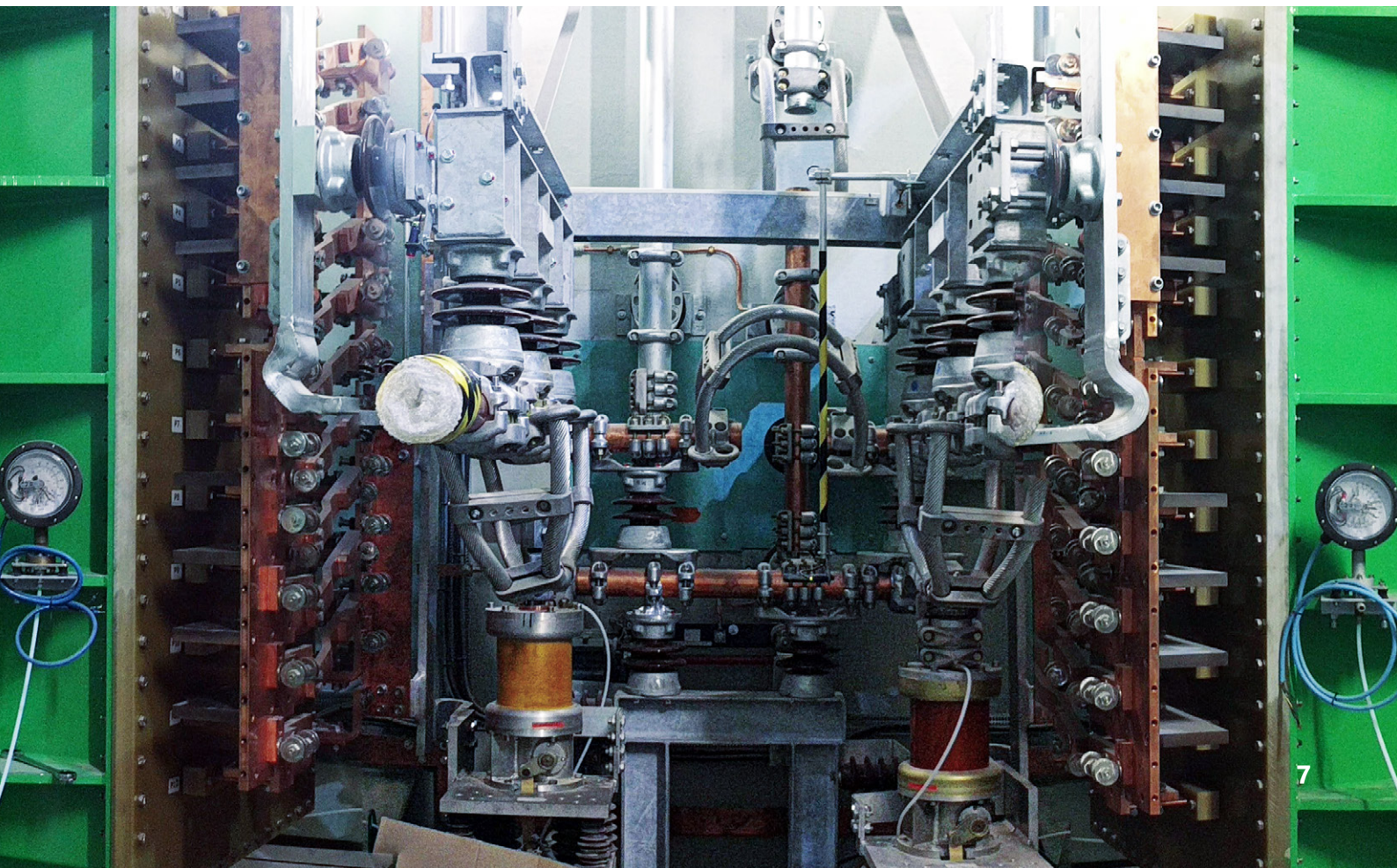
- 2 x 23 MVA – 2,000 V

Regulator transformer

- 10 V to 850 V and up 4,000 A

- Power factor < 0,15

Medium Power Test Laboratory with Transformers 1 & 2



HIGH VOLTAGE TESTING

The high voltage testing laboratory offers several options for short and long term insulation testing, and is equipped with three power frequency transformers and one impulse generator bank. Tests can also be performed under rainy conditions for outdoor equipment. The laboratory provides the necessary tools to measure Radio Interference Voltages (RIV) as well as Partial Discharge (PD).

TESTING PORTFOLIO

- AC power frequency tests
- Switching impulse tests
- Lightning impulse tests
- DC dielectric tests
- Combined voltage tests (BIAS)
- Chopped wave tests

TECHNICAL CAPABILITIES

- Power frequency - up to 1 MV 50 Hz
- Lightning impulse - up to 2.5 MV (1.2 μ s / 50 μ s)
- Switching impulse - up to 1.6 MV (250 μ s / 2,500 μ s)
- Direct voltage - up to 1 MV DC
- Partial discharge - up to 750 kV
- RIV testing - up to 550 kV

View of High Voltage Testing Laboratory



CLIMATIC & MECHANICAL TESTING

The climatic chamber is equipped with one room, which can reproduce extreme environmental conditions and temperatures from -60 °C to +60 °C.

Additionally the laboratory is equipped for leakage measurement by accumulation for gases such as SF₆, CF₄ or g³ – green gas for grid.

TESTING PORTFOLIO

Icing tests

Mechanical tests

Leakage measurements

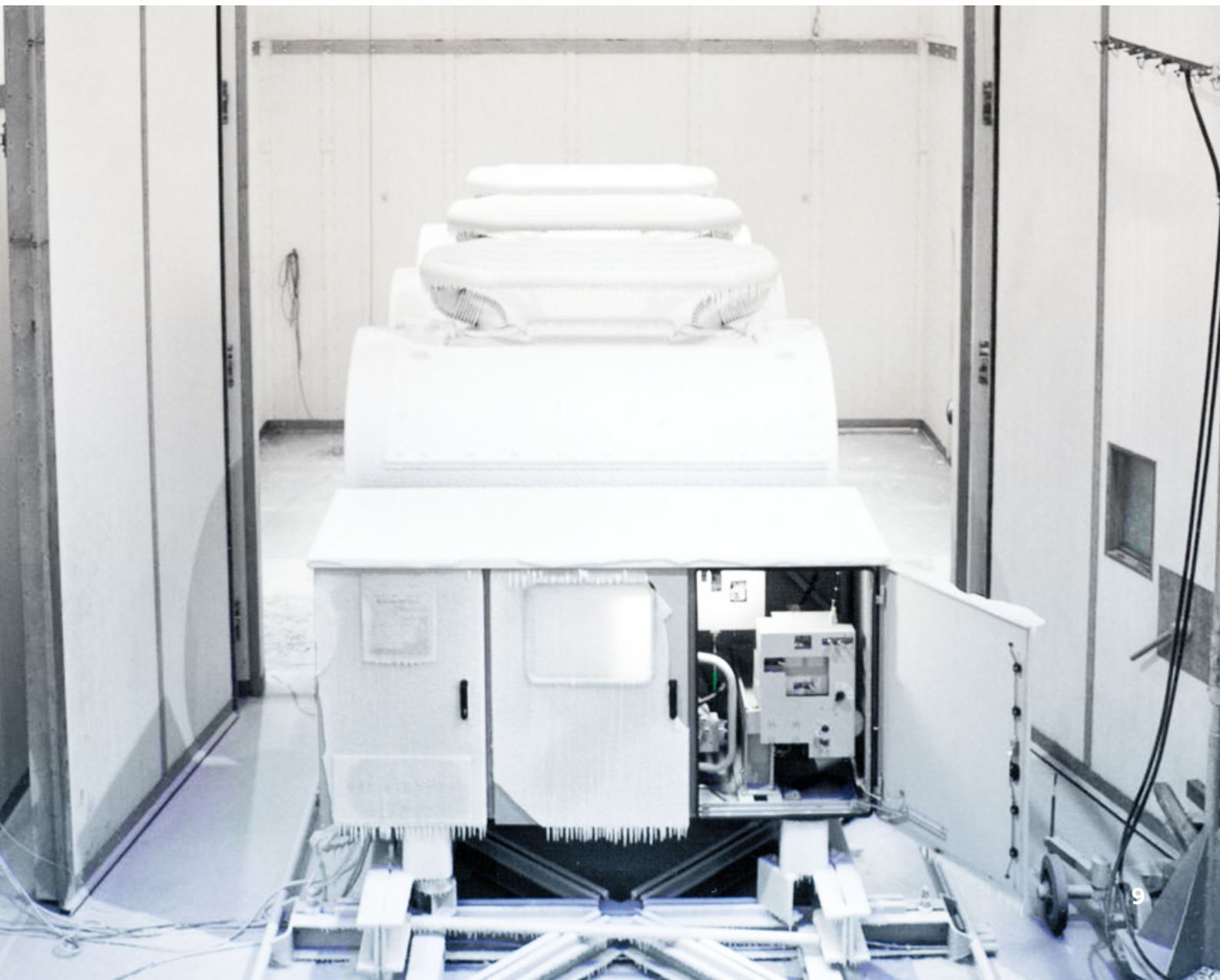
TECHNICAL CAPABILITIES

Temperature range - from -60 °C to +60 °C

DIMENSIONS

Testing room - D x W x H = 11 x 6 x 6.8 m

Generator Circuit Breaker (GCB) after climatic testing



TEMPERATURE RISE TESTING

This test laboratory can simulate the impact of the equipment on the environment e.g. the energy losses or radiation under nominal current applications. It is made of two independent, parallel testing rooms with its own current generator and allows to record up to 200 x PT1000 temperature sensors together. The ambient temperature can be controlled up to 40 °C.

TESTING PORTFOLIO

- Short term temperature rise tests
- Long term temperature rise tests
- Calculation of temperature rise values based on the resistance measurement of the current transformers

TECHNICAL CAPABILITIES

- Tests in AC – Single-Phase (50/60 Hz) - up to 50 kA
- Tests in AC – Single-Phase (50/60 Hz) - up to 10 kA
- Tests in DC - up to 4 kA

View of temperature sensors control panel inside temperature rise testing room



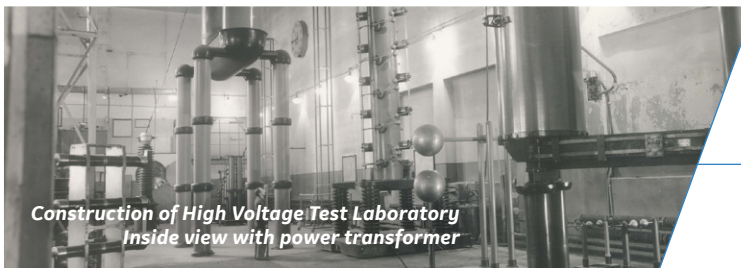
+85 YEARS OF EXPERIENCE

1929

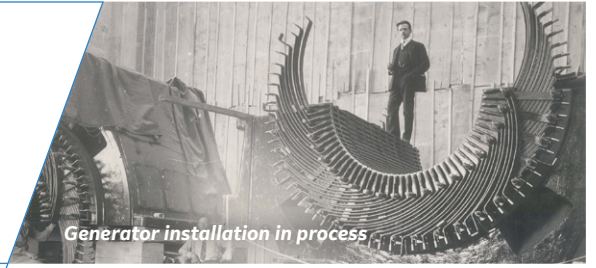
Construction of the high power test laboratory and installation of 600 MVA generator. CERDA becomes the first high power test laboratory in France

1955

Construction of high voltage testing laboratory. Installation of two 2,500 MVA generator extending the performance of the high power test laboratory



*Construction of High Voltage Test Laboratory
Inside view with power transformer*



Generator installation in process

1968

First synthetic laboratory with new testing methods

1970

CERDA, together with ESEF, became a founding member of STL

1987

Construction & installation of climatic test room



1994
Development of second synthetic laboratory

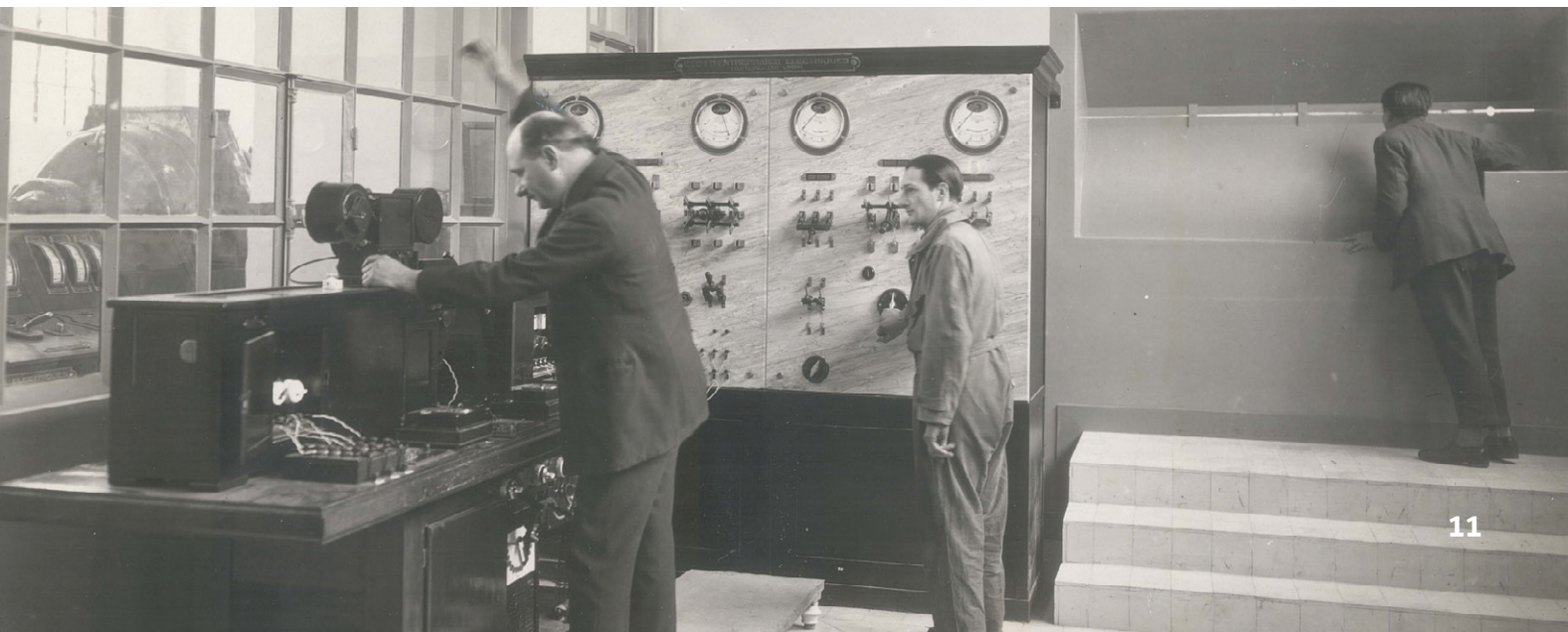
1994
First Accreditation by French committee COFRAC

2005
CERDA gets homologated to ASEFA Certification

2017

Extending of overall testing installations: Creating new testing halls according to highest standards. Installing new power transformers in the HV laboratory

High Power test room at work in 1960's





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TESTING LABORATORY



Address : 21, rue Cyprian
69 100 Villeurbanne, France
Phone : +33 (0) 4 72 68 34 34
Mail : cerda.testlab@ge.com
Website : www.GEGridSolutions.com/Cerda

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