



# Short-circuit testing services

Performing AC & DC investigation and type tests

SuperGrid Institute's short-circuit testing laboratory provides a unique set of capabilities to perform DC and AC tests.



## OVERVIEW

Powered by a 3 000 MVA short-circuit generator, it combines high voltage, high current (up to 80 kA) and adjustable frequency (10Hz-60Hz) to cope with a wide range of investigation and type test programs.

Test platforms are operated by CERDA, accredited according to IEC/ISO 17025 by COFRAC and member of ESEF ASEFA (France) and STL (international).

## SHORT-CIRCUIT TESTING SERVICES

- Definition of test protocols & test set-ups
- Test execution
- Test reports
- Test results analysis & expertise



## Field of application:

- MVDC
- HVDC
- MVAC
- MVDC

## Tested equipment include:

- Circuit breakers
- Load-break switches
- Cables systems & accessories
- Fault current limiters
- Fuses
- Reactors
- Arresters

## BREAKING & MAKING TEST CAPABILITIES

- DC tests – Up to 40 kA / 200 kV
- AC synthetic test:
  - 3-phase: up to 80 kArms
  - 1 phase: up to 140 kArms
- AC direct test – Up to 63 kArms

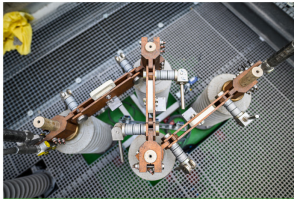
Other tests upon request.



The High Power Short-Circuit test platform - 25m (L) x 25m (W) x 25m (H).

## HIGH POWER SOURCE

### HOW THE PLATFORM WORKS



Power transformers

To adapt test voltage from 6 kV up to 190 kV: connections of 6 kV secondary windings.



3 000 MVA short-circuit generator

Able to provide short circuit current at several frequencies, from 10 Hz up to 60 Hz.



Short circuit test platforms

25m (L) x 25m (W) x 25m (H).



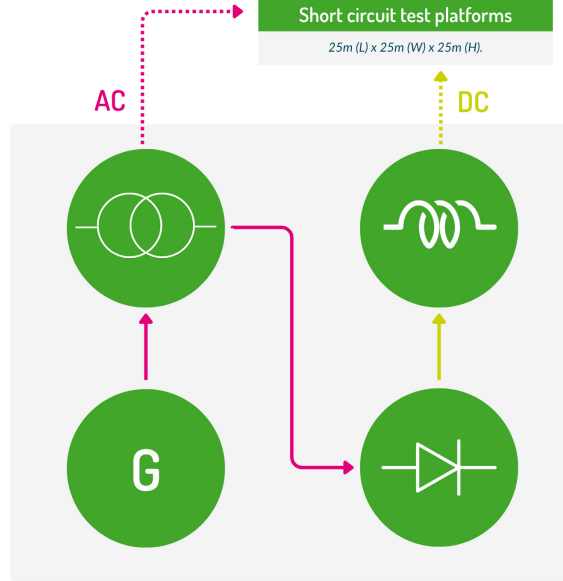
DC inductance sets

The test circuit's magnetic energy.



3-phase HV diode rectifier

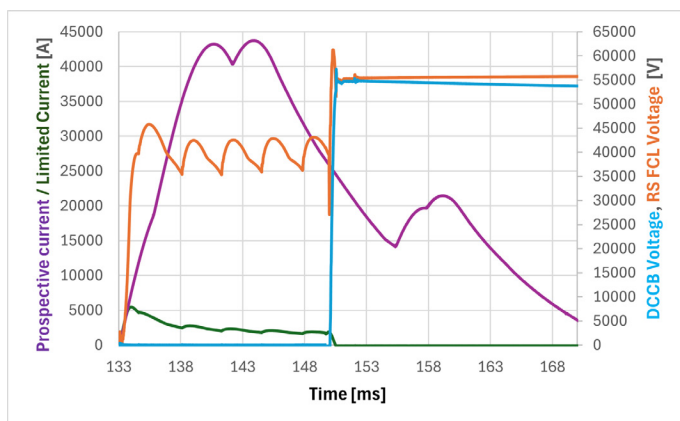
To perform DC short circuit current tests up to 200 kV DC and 40 kA.



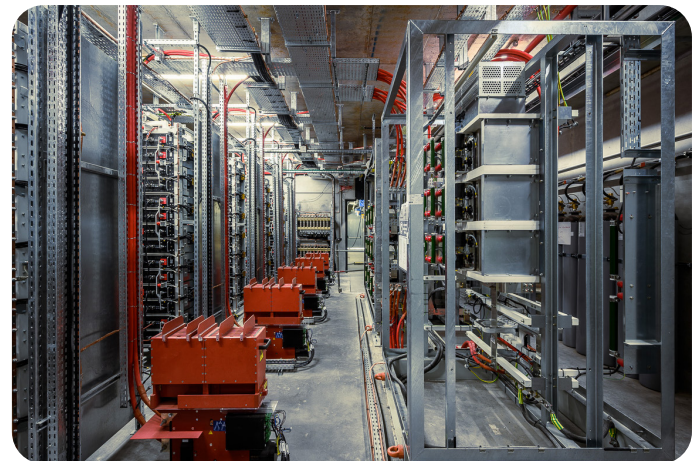
## HIGH-VOLTAGE DC TESTS ON A RESISTIVE FAULT CURRENT LIMITER

Using its short-circuit platform, SuperGrid Institute has validated its resistive superconducting fault current limiter (RSFCL) technology combined with a mechanical DC circuit breaker in major tests at 50kV.

20kV, 30kV, 40kV... crescendo, the voltage was raised to 50 kV DC and with 1.8 MJ injected! The RSFCL managed to limit the current to 5.5 kA, while the prospective current was 43 kAp. The DC circuit-breaker then cut off the fault current.



The graph shows the results of the test: in purple, the prospective current, in green, the limited current, in blue the current breaking with the DC circuit breaker, and in orange the voltage upstream of the limiter.



## A SUPERCAPACITOR BANK

Our high power source's excitation system: the supercapacitor bank is used to maintain current stability during high-current short-circuit tests.

Comprised of several hundred grid-tested modules and storing a total of 170MJ of energy, the installation is currently the largest supercapacitor bank in Europe.

## CONTACT

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