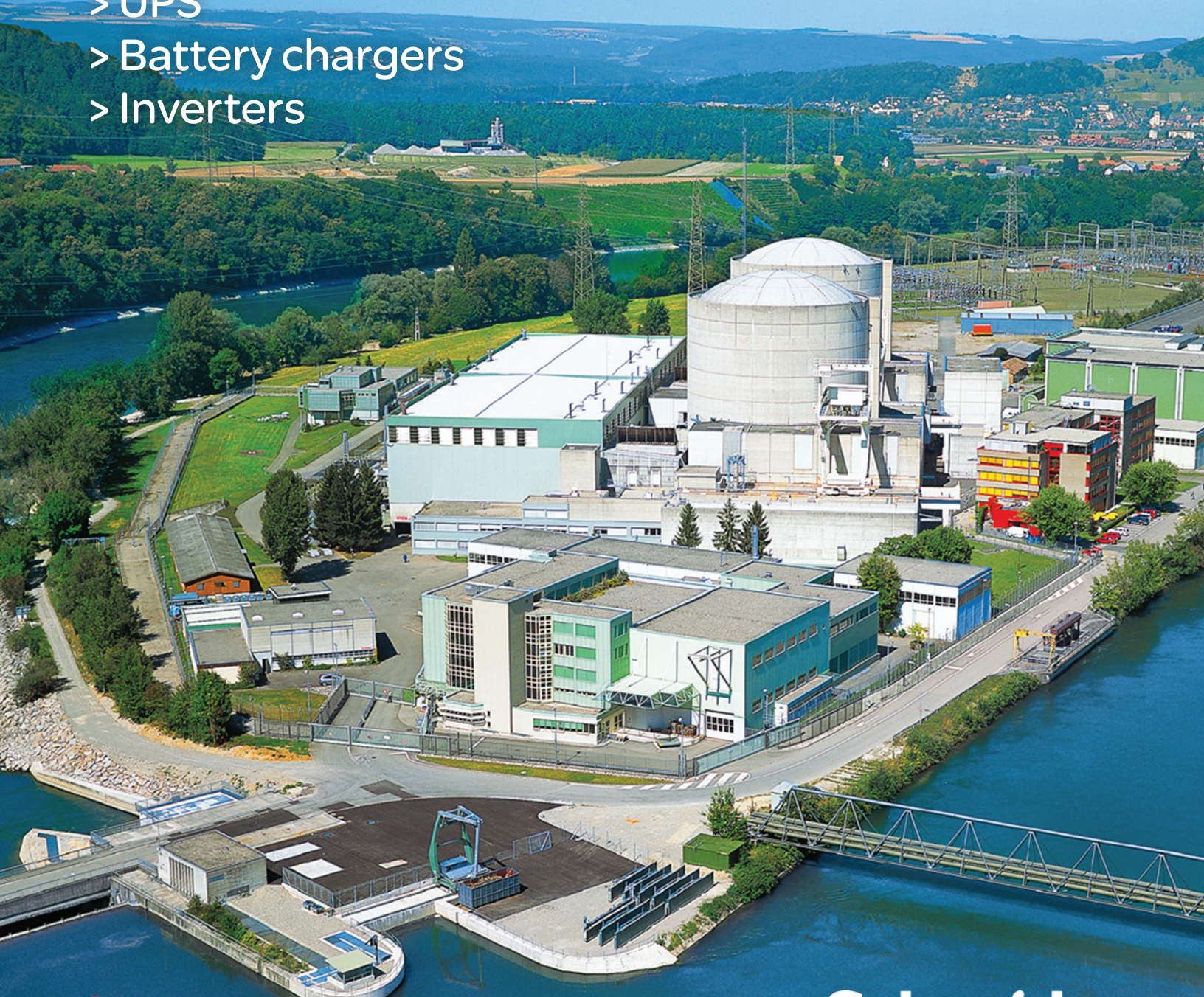


Nuclear Industry Applications

Customized solutions

- > UPS
- > Battery chargers
- > Inverters



Gutor
technology

Schneider
Electric

Introducing the Schneider Electric Full Solution Approach for Gutor secure power solutions

At Schneider Electric™, every step of a Gutor™ UPS' life cycle – from pre-sales and design through final testing and after-sales service – is custom-tailored to meet your specific needs.



A dedicated team of nuclear specialists

Let's face it: The nuclear industry is a very demanding market. Technical specifications, quality assurance, documentation, and equipment must all meet the highest standards for performance and reliability.

That's why experience matters. For over 30 years, we've led the way in critical-power solutions for the nuclear industry. Our team of experts is dedicated to providing you with customized solutions and comprehensive services that ensure your system operates at peak performance.

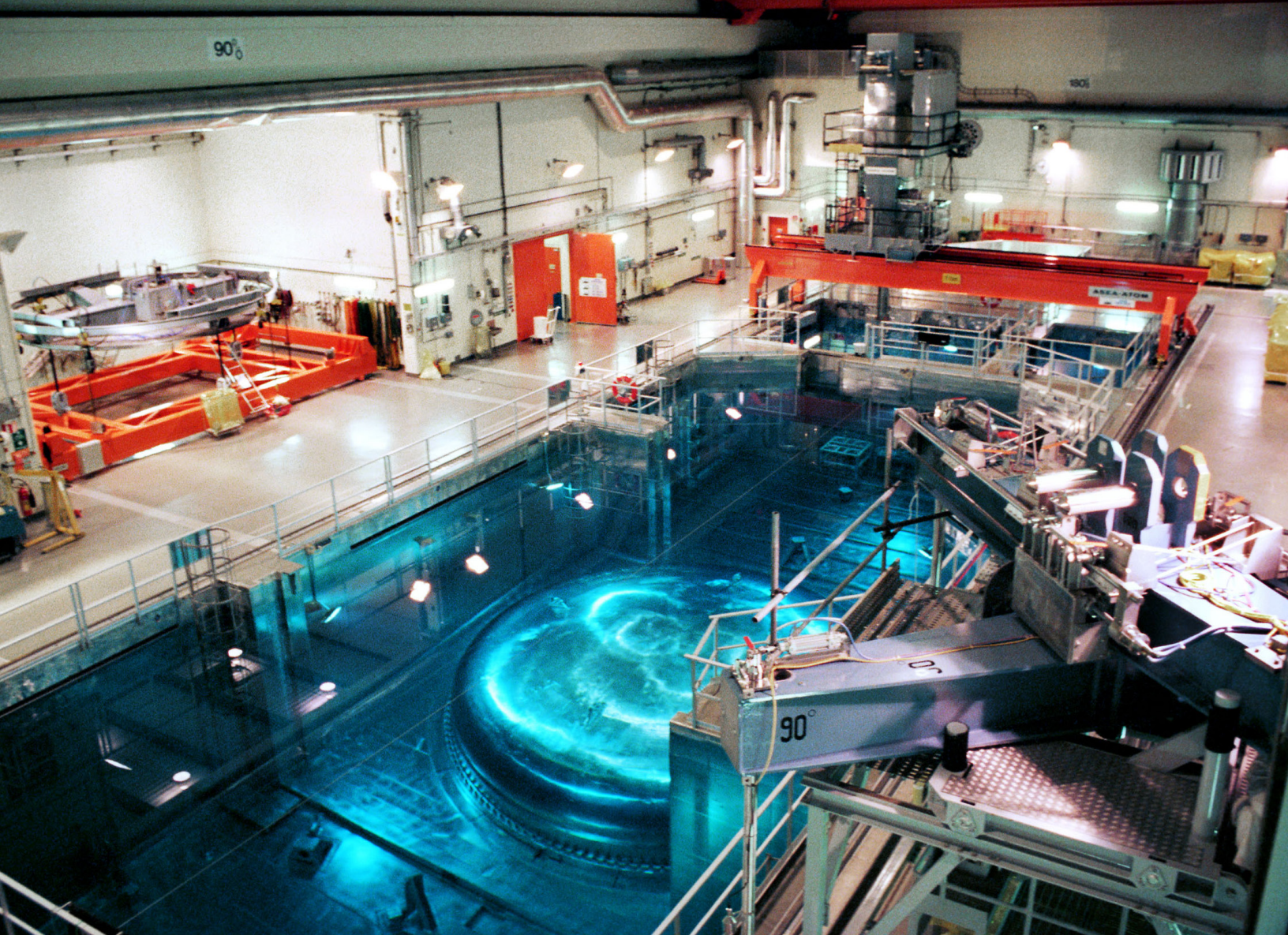
Our specialized Nuclear Team provides front-end design engineering support via:

- > Sizing your systems properly
- > Explaining features, benefits and options
- > Conducting field surveys to identify any needed fixes or replacements
- > Providing you with budgetary estimates and preliminary drawings
- > Other nuclear project-related consulting services

Our team works with you to understand your specific requirements and then translates these into a battery charger, inverter, or UPS solution. We also make sure to consider technical safety, documentation, and test requirements, as well as other important factors.

We have supplied nuclear plants with over 2,200 system types for 135 reactors in 22 different countries. Our expansive systems offering can be suited for a variety of reactor technologies like ABWR, AP1000, BWR, CANDU, CPR EPR, PWR, PHWR, and VVER. This brochure provides an overview of our expansive nuclear capabilities.





Technology

Gutor UPS technology is based on flexible power modules, which allow the design of customized solutions to meet specific needs.

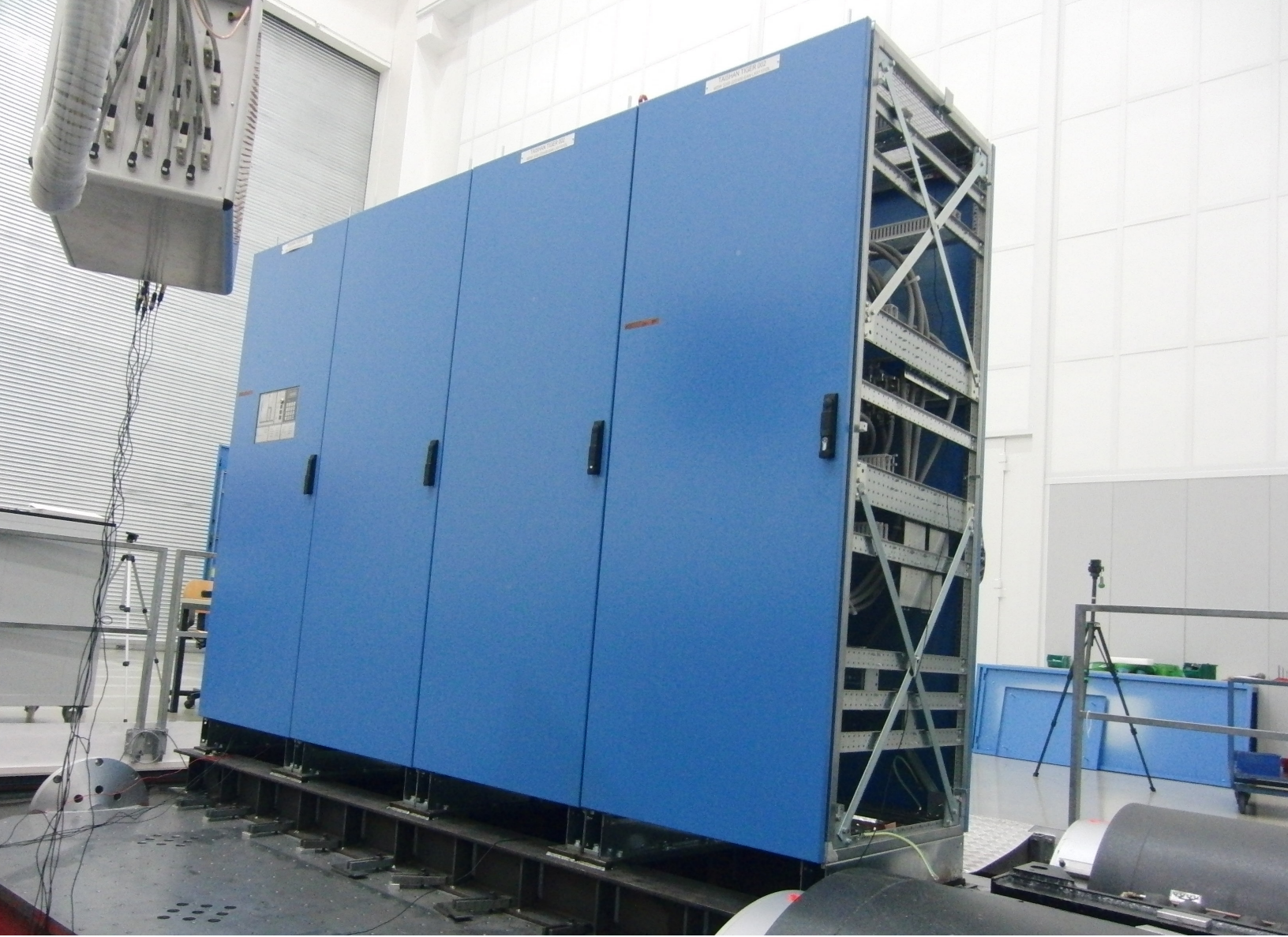
Our product range:

- > Battery chargers up to 1,200 ADC
- > AC inverters with power ratings up to 750 kVA
- > Double conversion UPS systems with power ratings up to 750 kVA
- > Higher ratings available upon request

Spare parts and replacement-kit availability is guaranteed for the lifetime of the equipment.

These complementary solutions are designed specifically for nuclear applications:

- > **High-DC voltage limiter:** designed to protect the system from over-voltage due to a power line surge (e.g., the Forsmark event)
- > **Battery discharge unit:** allows the discharging of batteries to feed energy back to the grid
- > **Diagnostic unit:** standalone unit can be plugged into the UPS to perform a wide range of diagnostic tests easily



Qualification

Schneider Electric has substantial experience in testing and analyzing our products for compliance with nuclear industry standards, including environmental, seismic, and EMC qualifications. As a result, we can customize individual qualification packages to suit your specific project's needs.

Seismic design qualification

Schneider Electric has many years of experience in performing the following two seismic qualifications:

Full-scale test

In this more conventional approach, we mount a system on a seismic table, energize it, and test it according to the project-specific seismic-response spectrum. Schneider Electric has a wide range of test results available.

Combined method

This approach combines physical full-scale testing of the individual components with a dynamic analysis of the overall system. This allows us to optimize custom system designs, and lowers costs by eliminating the need to build a prototype system.

Both of these approaches are in line with the IEEE®-344, IEC®-60068, and IEC-60980 standards.

Firmware quality and qualification

We understand that quality assurance and firmware qualification are very important subjects. That is why we have been investing heavily in these areas the past years.

Our system firmware has a proven track record of faultless performance. In addition to compliance certification for IEC nuclear standards, our firmware has also been approved under software standards and guidelines, such as CSA® N290.14 in Canada, and EPRI 106439/107339 in the USA.



Other qualifications
Schneider Electric has expertise in system qualifications for environmental factors such as humidity, temperature, vibration, and EMC.



Safety related firmware certificates issued by the TÜV certification body

Quality assurance

Schneider Electric has an extensive quality assurance (QA) system, certified to comply with the ISO 9001:2008 standard. Under this certification, all processes and procedures, including relevant work instructions and safety measures, are clearly documented, certified (OHSAS 18001:2007) and available to all employees.

Over the last years, Schneider Electric has adapted its QA system to comply with specific nuclear safety and high technology quality standards, such as:

- > KTA1401
- > CSA Z299.2
- > 10 CFR 50 Appendix B
- > ASME NQA-1 1994/2008
- > IAEA 50-C-Q

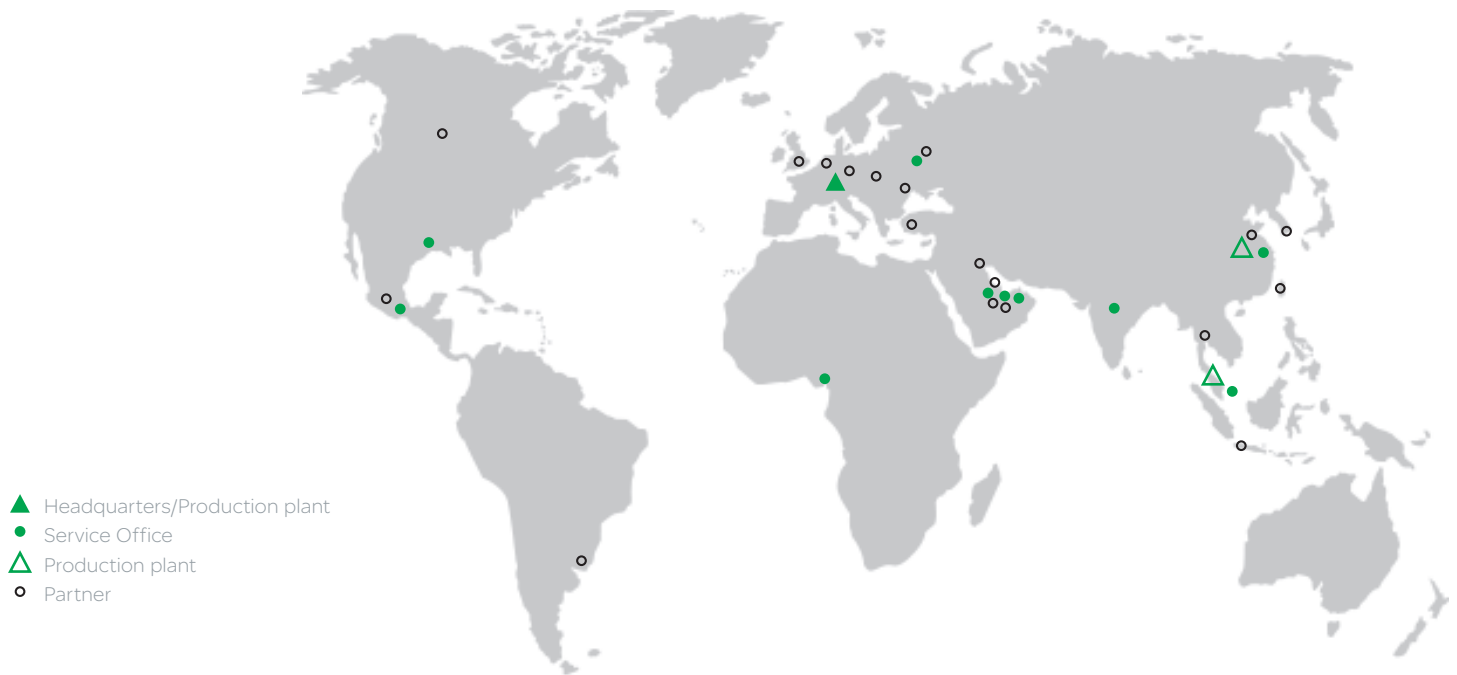


International standards

Our systems comply with all relevant international standards. They also meet the requirements of the widely recognized IEEE and IEC standards specific to nuclear power plants. Below is a brief overview of the major standards that we comply to.

	General IEC UPS standards	Keywords
	IEC-62040-1	General and safety
	IEC-62040-2	EMC
	IEC-62040-3	Testing and performance
	IEC-60950-1	ITE Safety
	IEC-60146-1	Semiconductor converters
	IEC-60146-2	Inverters
	IEC-61439	Switchgear assemblies
	IEC standards specific to nuclear power plants	
	IEC-60780	Electrical equipment, qualification
	IEC-60880	Software for computers important to safety
	IEC-60980	Seismic qualification
	IEC-61225	Electrical supply systems
	General IEEE UPS standards	
	IEEE-944	Application and testing
	IEEE standards specific to nuclear power plants	
	IEEE-323	Class 1E equipment, qualification
	IEEE-344	Seismic qualification
	IEEE-650	Chargers and inverters, qualification
	General NEMA UPS standards	
	PE 1	General and performance testing
	PE 5	Battery chargers
	General UL UPS standards	
	UL 1778	Safety
	GOST Nuclear power plant standards	
	PNAE G-9-027-91	Design, emergency power systems
	PNAE G-5-006-87	Design, seismic resistance
	General RCC UPS standards	
	RCC-E	Design and conception rules

Contact us



Global organization

Schneider Electric recognizes the importance of an international presence. In order to best serve our customers, we have established sales and service offices worldwide, as well as a strong network of partners. Our dedicated specialists for the nuclear industry are also internationally based in Switzerland, Germany, China, Russia, and the US.

For more information visit www.schneider-electric.com

Headquarters:

Gutor Electronic LLC
Hardstrasse 72 – 74
5430 Wettingen, Switzerland
P +41 (0)56 437 34 34
F +41 (0)56 437 34 44
gutor.info@schneider-electric.com

