

onsite

HV SOLUTIONS

NUCLEAR POWER GENERATION

Technical consultancy, commissioning and maintenance of power cables with emphasis on Small Modular Reactors (SMR)



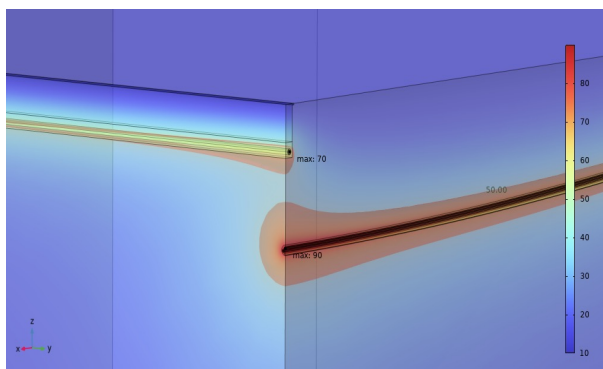
About Our Team

- Over 30 years of experience in the development and application of technical solutions across various industries working in the field of the electric power delivery, combined with deep practitioner's insights
- Broad experience in developing and delivering industrial solutions and services tailored to individual client needs
- Internationally recognized scientific and applied knowledge in the field of on- and offshore power cables
- Unique personal network of international contacts with electric power companies and academic institutions resulting from many years of active participation in international regulatory bodies such as IEEE, Cigre and IEC.



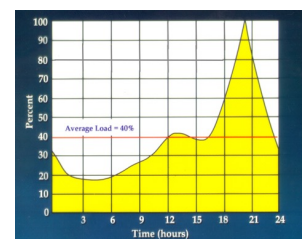
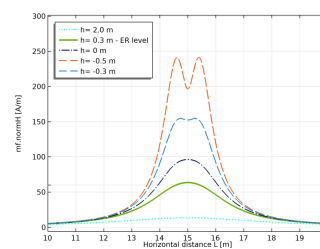
Testing, Installation & Maintenance

- Reliability requirements for power cables and cable accessories
- Electrical requirements during cable design
- Complex cable system tests - types, scope of tests, test procedures, criteria for evaluation of measurement results with e.g., mechanical-, electrical-, and non-electrical tests for:
 - Inspection and acceptance tests (FAT)
 - Tests before laying the cable (verification that the cable has not been damaged during transport)
 - Inter-operational tests (connections of subsequent cable sections, possibly after other works)
 - Acceptance tests after building the cable line (SAT)
 - Condition based maintenance (CBM) during cable line operation lifetime
 - Test in case of a failure during operation



Our Competences in the Field of Cables for Power Generation

- Since more than 15 years onsite hv solutions ag is a globally operating onsite services and consultancy firm based in Switzerland that has been providing technical advisory services in the field of electrical power systems with an emphasis on power cables installed in on- and offshore power generation, distribution, and transmission
- Our team is comprised of world-leading experts who support national and international companies in solving their most complex problems regarding the design, installation, testing, and service life management of on- and offshore power cable systems
- Within the field of nuclear power electrical systems, we have deep expert knowledge in various aspects of power cable circuits management.

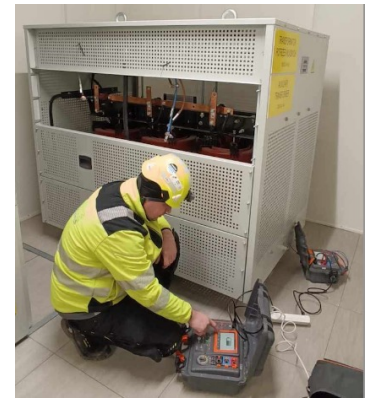


Construction, Design & Laying

- Environmental aspects
- Determination of the cable short-circuit strength
- Current carrying capacity and operating temperature
- Cable construction and cable corridors
- Power losses in cable systems
- Reactive power compensation in cable systems
- Cable routing systems

Power Cable Systems in Small Modular Reactors (SMR)

- The power cable circuits for SMR are responsible to deliver large amounts of electricity generated by an SMR to the grid
- Specific requirements depend on the SMR's power output and its distance from the grid connection
- While SMR designs themselves prioritize passive safety and modularity to minimize complexity and dependence on external power sources, the electrical infrastructure, including the cables, remains crucial to power delivery and must meet the same stringent safety, reliability, and high-efficiency standards as large nuclear power plants



As the SMR power cables have to

- be the high-quality components that comprise the entire SMR power plant system
- ensure safe and reliable power transmission from the reactor to the grid
- meet the stringent standards for nuclear energy applications

Our expertise can help you to avoid

- randomness of applied solutions dictated by price and timetable optimizations
- numerous disputes regarding the compensation for improper technical performance or defects during the warranty period
- unacceptable lack of reliability in the national energy production system

Reliability Aspects of SMR Power Cables

High-capacity electrical transmission	SMRs generate significant electrical power, with a potential capacity up to 300 MW. The power cables must be able to transmit this power safely to the grid or to end users. This requires robust conductors and insulation suitable for high electrical loads.
Standardized specifications for nuclear applications	The power cables have to be high-quality electrical components that meet the stringent safety and reliability standards of the nuclear industry.
Reliability and availability	SMRs are designed to provide a stable, reliable power supply comparable to that of large nuclear power plants. Therefore, their power cable circuits must also be highly reliable to ensure an uninterrupted power supply and meet the demanding requirements of all end users.
Safety and elongation	Given the severe conditions in a nuclear power plant and the possibility of being exposed to extreme temperatures, radiation or physical stress, the cable circuits including components like terminations, joints are designed, manufactured, installed and tested to be durable and resistant to these conditions.
Grid connectivity	Power cable circuits are the final element in the energy supply chain, connecting the electricity generated by the SMR module to the public electricity grid or to industrial and residential users.
Modular and passive design	The power cable systems are part of the overall system, while the SMR itself is based on modularity and passive safety features, this design philosophy also influences the supporting infrastructure.

By nuclear power generation mindlessly implementing low-cost power cable solutions is highly inadvisable and risky !

To avoid this, it is necessary to establish a clear set of rules and guidelines to ensure the qualification of designers, suppliers and contractors.

Facts and figures



10000 +

Kilometres cable circuit lengths tested



100 +

World-wide satisfied customers in more than 25 countries



20 +

Years successful experiences of onsite testing



20 +

World-wide successful participation on offshore wind parks projects

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