

# Comprehensive science and research support for the electric power sector

## HIGH VOLTAGE AND POWER PLANTS DEPARTMENT

High-voltage devices, power plants and other electricity facilities are at the heart of our scientific work. In addition to our comprehensive research work in the field of power engineering, we also carry out the most demanding tests and measurements on HV installations. Our expertise is also indispensable in the design and construction of electric power facilities.



Research is conducted in the field of electric power sector, utilising two of our own laboratories.



Tests and measurements are carried out in accordance with international standards.



In addition to companies and industry, our knowledge is also shared with scientific institutions.

We are a competent source of knowledge and experience for companies and industries related to the electric power sector. Among other things, we are actively implementing advanced IT support for e-measurements and e-professional assessments.

Our close collaboration with esteemed national and global scientific research institutions allows us to facilitate knowledge exchange at conferences and international associations. In addition, we have Laboratories for Machinery and High-Voltage.

### WE CARRY OUT OVERVOLTAGE ANALYSIS AND INSULATION COORDINATION

- Discussing overvoltages (temporary, switching, lightning) and insulation coordination tasks.
- Performing computer simulations of electrical transients and numerical analyses.
- Determining the insulation level and calculating the operational reliability of overhead lines (lightning overvoltages).
- Checking the adequacy of protection against direct lightning strikes.
- Calculating overvoltages and the dimensioning of overvoltage protection (position, number, technical characteristics of arresters).

### WE VERIFY THE TECHNOLOGY AND CHARACTERISTICS OF HIGH-VOLTAGE DEVICES

- Publishing expert opinions on the suitability of devices and technical solutions.
- Performing computer-aided numerical calculations of fields (temperature, magnetic, electric).
- Testing HV devices and performing measurements.
- Determining the technical parameters of devices and cables and calculating heating for different lagging methods.
- Verifying manufacturers' capabilities, from input materials and manufacturing to testing and transportation.
- Cooperating with investors and project engineers during tendering process.
- Supervising tests and QA procedures during the factory acceptance testing (FAT) of devices at manufacturers.

## WE STUDY THE CONDITION OF HIGH-VOLTAGE DEVICES

- Carrying out tests and measurements in the High-Voltage Laboratory.
- Monitoring the insulation of HV devices and carrying out voltage tests on cables in electricity power facilities.
- Providing numerical processing and systematic storage of data for subsequent analysis.
- Establishing conditions based on measurements and operational data.
- Involvement in fault and disturbance detection.
- Participating in the maintenance procedures of HV devices.
- Contributing study work in the field of solving operational problems of electric power facilities.



High-Voltage Laboratory

**The excellent skills and scientific approach of the staff in the High-Voltage and Power Plants Department ensure the smooth operation of the Slovenian electric power sector and promote the development of advanced solutions and systems.**



EIMV Excitation System

## WE MONITOR THE OPERATION OF POWER PLANTS

- Involvement in monitoring, measuring and establishing operational characteristics of individual electrical and mechanical devices, device assemblies and entire electrical power or industrial facilities.
- Ensuring expert analyses of causes of defects on electrical and mechanical equipment in power plants, industrial facilities and the implementation of appropriate rehabilitation guidelines.
- Assessing the remaining lifetime of critical components of power plant operation.
- Involvement in identifying system aspects of power plant operation and revitalisation.
- Carrying out technical inspections, measurements and analyses of production facilities.

## WE GUIDE THE CONSTRUCTION OF ELECTRIC POWER FACILITIES

- Consulting in the introduction of new technologies and solutions in the electric power system.
- Cooperation in the determination of technical specifications, the selection and ordering of HV devices.
- Consulting on the procurement, manufacturing and installation of power transformers.
- Help in planning, construction and restoration of electric power facilities.
- Resolving technical issues during construction.
- Monitoring functional tests.
- Technical revisions and expert assessments upon the conclusion of works.
- Ensuring the fulfilment of requirements of standards and legislation.

## WE MONITOR NUCLEAR AND RADIATION FACILITIES, RADIOACTIVE WASTE AND USED FUEL

- Managing activities during overhauls and upgrades and strengthening the safety culture.
- Preparing safety reports, procedures, technical specifications and other documentation.
- Checking the adequacy of electrical systems.
- Ensuring the integrity of control, protection and instrumentation.
- Preparing accident analyses (probabilistic and deterministic), including internal and external events, security report, procedures, technical specifications and other documents.
- Planning protection against radiation.
- Verifying the impacts of radiation on the environment, including monitoring.
- Preparing assessments in connection to radioactive waste disposal sites.