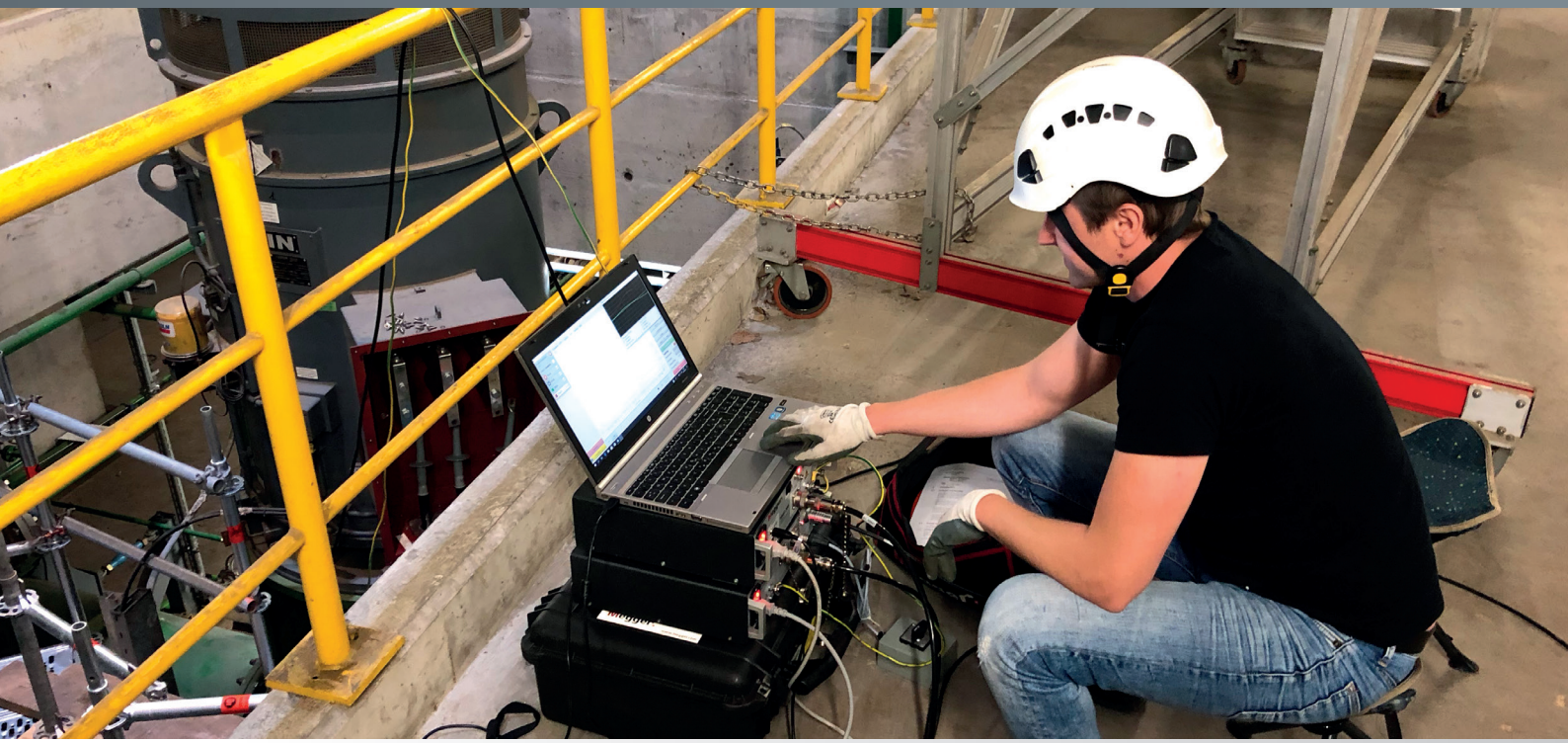
Medium- and High-Voltage Cable Testing with the ACRF Resonant Method



The Milan Vidmar Electric Power Research Institute has more than 30 years of experience in cable testing and conducting research of cables. As the only institute in Slovenia we dispose of equipment enabling testing and measurements on cables of all voltage leves to 400 kV.

Tests and measurements on cables are carried out in accordance with international standards for medium- and high-voltage cables:

- IEC 60840,
- SIST HD 632 S3,
- IEC 62067,
- SIST HD 620 S2,
- SIST EN 60502-2,
- IEEE for medium- and high-voltage cables.

WHY CABLE TESTING?

Ensuring the reliability of electric power system operation, which also includes important medium- and high-voltage cables, is an important task of system operators and network owners. **Damage on cables** often occurs at the production and installation of cables, and most times cannot be revealed in any other way than by **standardised raised voltage testing.**

This is the **only testing method** used to prove that insulation endures potential overvoltage during operation. In this sense, a 24-hour trial connection to system operation voltage, permitted in extreme cases by the standard, is insufficient.

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WE HAVE THE EXPERTISE, EXPERIENCE AND PROFESSIONAL EQUIPMENT

The **basic method** for examining cable installation quality and the quality of terminations and accessories includes **testing of the cable oversheath after installation,** which, however, provides the basic information about sheath integrity. Enhanced operation reliability of the cable can be ensured only by carrying out the **increased voltage test.**

The Milan Vidmar Electric Power Research Institute is equipped with experience and the resonant test system that enables testing on long cables and quality assessment with measurements.

We provide a comprehensive solution for cable testing that includes low-voltage measurements that are the basis (prerequisite) for carrying out the most important measurements at high or increased voltage.

These measurements are:

- dielectric loss factor tgδ and Cx capacitance measurement and
- PD partial discharge measurement.

The first measurements of the mentioned parameters provide reference values at installation for subsequent periodical measurements. They are the indispensable method for evaluation the condition of the functioning and for estimating the remaining life span of the cable system.

Increased voltage measurements are carried out with the variable frequency resonant system spanning from 20 to 300 Hz. Insulation inspection according to this method is conducted in conditions that reflect operating conditions.

IT IS IMPORTANT TO KNOW

The **most important measurements on cables** that must be carried out are **tests after installation.** They confirm that the cable is prepared for operation and without any damage.

By **carrying out preventive maintenance** that encompasses systematic use of test procedures and diagnostic methods for monitoring the condition of the main cable insulation, we provide the foundation for a timely and appropriate selection of maintenance measures. **Periodical measurements** are the basis for determining the condition of cable system insulation, and as such, it is a necessary part of the modern RCM or Reliability Centred Maintenance strategy and effective asset management.

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