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APPLICATION OF TECHNOLOGIES DEVELOPED WITHIN THE ITER PROJECT TO CREATE TRT FACILITY BY THE EXAMPLE OF AN EMC POWER SYSTEM ^{*)}

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JSC NIEFA has been developing switching equipment for the ITER project since 2011. During this time, the company’s specialists have come a long way from preliminary calculations to the manufacture of prototypes and qualification tests of both individual components and the entire switching system as a whole.

The designed equipment ensures the functioning of the thermonuclear reactor at the stage of initiating a plasma discharge and maintaining the combustion of the plasma cord, and performs the function of protecting superconducting windings by the fast discharge of energy stored in the magnetic field to prevent overheating of the section of the winding that has lost its superconducting properties. A failure in fast discharge process can cause irreversible damage to an installation costing billions of dollars, so the reliability of switching devices is extremely demanding.

Technologies and competencies obtained during the development and testing of unique high-current switching equipment, which is the main part of the power supply system for superconducting windings, carried out at JSC NIEFA within the framework of the ITER project, can be easily adapted for use within the framework of the Russian thermonuclear fusion program.

Thus, within the framework of the TRT project, the experience of creating the following components of the electromagnetic system (EMS) power supply system can be realized: apparatus for operational current switching and fast discharge systems, control and measurement systems for currents and voltages, a complex of current-carrying busbars, a grounding system, and a control system.

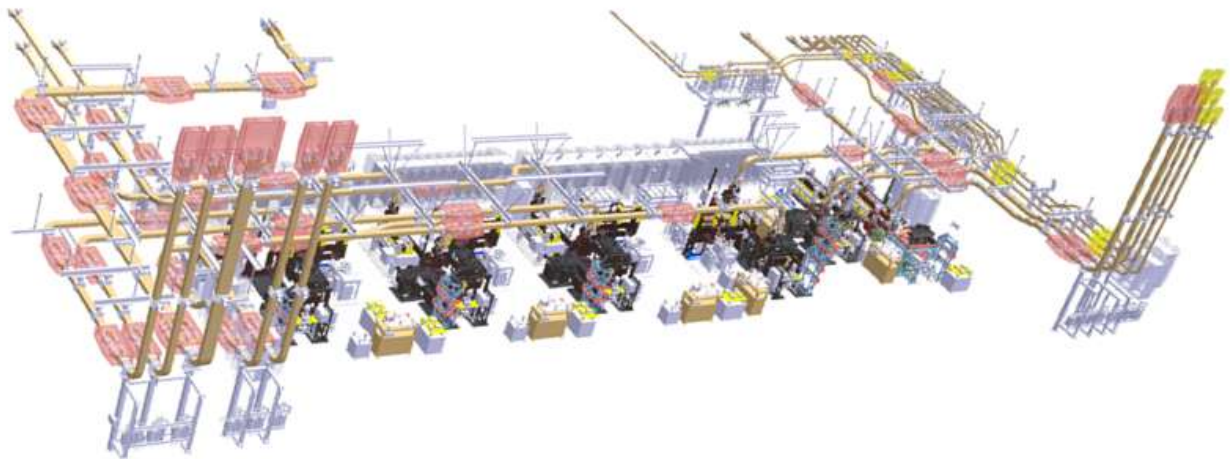


Figure 1

^{*)} [abstracts of this report in Russian](#)