IMPLEMENTATION OF THE COMBINED RELAY PROTECTION SYSTEMS IN DISTRIBUTION GRIDS WITH SEVERAL SOURCES

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Purpose. Creation and integration of relay protection combined structures based on microelectronic and electromechanical elements into distributed electric networks for costs reducing and improvement of their operation modes reliability, especially in conditions of several power sources or decentralized electricity supply systems. The availability of decentralized energy sources and their potential impact on the transient mode parameters in emergency of the power grid are examined.

Methodology. The methodology of combined structures creation is based on standard approaches of relay protection providing in compliance with technical restrictions and standard requirements concerning the possibility of power flows from several sources.

Findings. The basic electric circuit of the protective relay device was developed, which allowed changing the relay protection settings in the autonomous mode, without losing the sensitivity of the mechanism for selecting the direction of power supply. The developed system will allow maintaining the selectivity in the after-failure mode or during the generation from decentralized energy sources, being guided by the power flow. Application of the microelectronic base in combination with traditional electromagnetic and inductive relays. Previously, protection relay devices were divided separately into electromechanical, electrostatic, microprocessor types without smart combinations of each types. The use of simple circuit solutions makes it possible to reduce the cost of relay protection devices, facilitate servicing and repair, and extend the life of equipment. The obtained results can be used by electric-grid companies to ensure reliable protection of the network, especially with the wide introduction of decentralized energy sources

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Key words: combined relay protection system, schemes decisions, redundancy, microelectronic base, decentralized energy sources.

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DEVELOPMENT OF PILOT BATCH AND GRADE ESTIMATION OF COILS OF STEEL GRADE S355MC AT ROLLING MILL "1700", PJSC "ILYICH IRON AND STEEL WORKS"

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Purpose. Development of technology of hot rolling coils using thermo-mechanical controlled process for the wide-strip rolling mill and grade estimation of coils.

Methodology. Technology was developed and the first batch was produced using thermo-mechanical controlled process and improvement in surface quality was achieved via air cooling to a certain temperature.

Findings. There has been developed technology, and pilot batch of hot rolling coils (6×1500 mm, steel grade S355MC) has been produced using thermo-mechanical controlled process (TMCP) for the wide-strip rolling mill 1700. The integrated technology for TMCP coil production (steel grade S355MC) has been firstly developed for the rolling mill 1700 in accordance with EN 10149-2. Air cooling for coils to 450°C after coiling has been firstly used in the developed technology, which provides for decrease in air scale and improvement of surface quality for the customers.

Keywords: thermo-mechanical controlled process, hot rolling coils, rolling force, temperature conditions, technology

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