

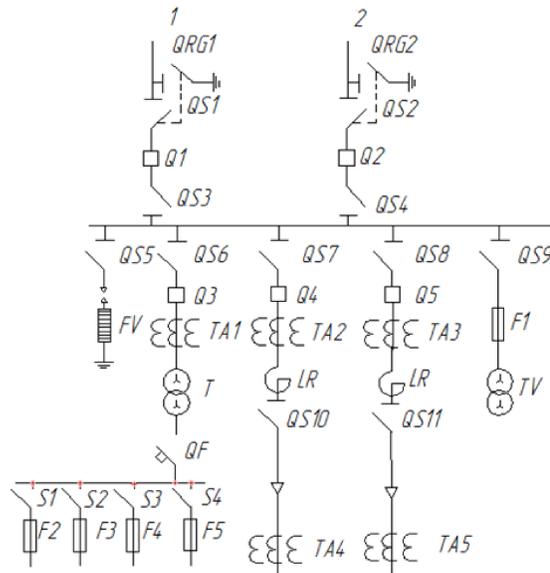
OPTICAL SYSTEM OF COLLECTION AND INFORMATION TRANSMISSION FOR THE CENTRALIZED SYSTEM OF CONTROL OF THE AVERAGE VOLTAGE POWER ELECTRICAL INSTALLATION.

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Purpose: The research activity is aimed at consideration of the information collection and transmission system of a centralized relay protection and automation system for medium voltage electrical installations based on a passive optical bus. Also it is aimed at consideration of issues concerning electromagnetic compatibility of technical means.

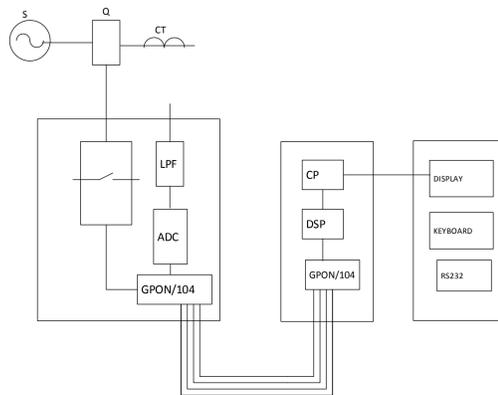
Description of the work done: Since the electric power industry objects are characterized by a complex electromagnetic environment, including a significant adverse effect on the reliability and full functionality of modern microprocessor relay protection and emergency automation systems, a solution for a centralized relay protection and automation system based on xPON passive optical network technology is considered.

Materials and methods: During the research, the main materials were scientific articles of foreign and domestic authors; technical documents presented by PC "ROSSETHY".



Schematic diagram of the distribution point for seven cells:

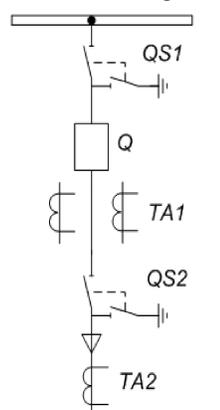
Q - oil circuit breaker; QS - disconnector; QF - circuit breaker; S - switch; F - fuse; QRG - earthing switch



The block diagram of the proposed CRPS:

CT-circuit transformer, LPF-Low-pass filter, ADC analog-to-digital converter, CP-central processor, DSP-digital signal processor.

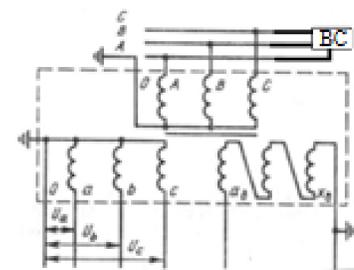
In the proposed centralized system, all the logic of protection and automation is concentrated in one device - the server; an important role in this case is played by the communication line of the server with the coupling units in the switchgear.



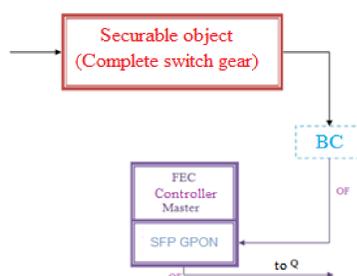
medium voltage off-line



connect BC to the current transformer in the switchgear



connect the BC to the voltage transformer in the switchgear



Block diagram of CRPS:
Protected object RP, BC-bay controller, SFP GPON-SFP module
ONT GPON, FEC controller - central server CRPS, Q-switch, OF - LAN.

Results: Based on the analysis of the trend in the development of modern relay systems, a schematic diagram of the proposed centralized control system is modeled.

Conclusions: The centralized control system is a multifunctional complex that provides protection of medium voltage power plants against all types of damage and abnormal operating modes.

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