ABSTRACT

The electric power network generally consists of a generating center, a transmission network (main substations and transmission lines), and a distribution network. In an effort to increase the reliability of electrical energy supply, the need for an adequate protection system cannot be avoided. The protection system consists of current transformers (CT), potential transformers (PT), circuit breakers (CB), DC/AC power supplies, protection relays, and teleprotection equipment, all of which are integrated into a wiring diagram.

The protection system must have the following requirements: sensitive, that is, capable of feeling the slightest disturbance; reliable, that is, it will work when necessary (dependability) and will not work if it is not needed (security); selective, that is, capable of isolating only disturbed networks; and fast, that is, capable of working as quickly as possible.

The transformer protection system, which consists of main protection (differential relay, restricted earth fault relay/REF) and backup protection (overcurrent relay/OCR, and ground fault relay/GFR), functions to protect the transformer both on the HV side and on the LV side. The function of protection equipment is to identify disturbances, separate the part of the network that is disturbed from other parts that are still healthy, and at the same time protect the part that is still healthy from damage or greater loss.

Chronological discussion of the disruption of Transformer #2 60 MVA in the Digital Substation System (DSS), which occurred on March 3, 2021 Whereas DSS is an evolution of conventional substations with input and output as well as measurements such as status, control, and analog measurement of CT/VT input from equipment in the switchyard, it is no longer sent directly to the control and protection relay (IED) via ordinary cables (hardwiring), but rather in the form of network data. By using the IEC 61850 Process Bus

Keywords: Restricted Earth Fault (REF), Digital Substation System (DSS), Current Transformers (CT), IEC 61850.