DEVELOPMENT OF AUTOMATIC TRANSFER SWITCH

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Abstract – We consider an automatic entry reserve - method of protection designed for the smooth operation of the electricity network. Enabled by means of an automatic connection to a network of other sources of supply in case the main source of power supply failure.

I. Introduction

Automatic entry reserve - this method of protection designed for the smooth operation of the electricity network. Enabled by means of an automatic connection to a network of other sources of supply in case the main source of power supply failure.

Automatic transfer switch (ATS) connects a backup source of power, while the break power of 0.3-0.8 seconds (backup time switch operation). The main objective AVR- timely operation within minimum possible time that has elapsed since turn off the main power source, and therefore the automatic input of a reserve - a task that must be solved only by qualified personnel.

To ATS requirements:

- shall operate in the shortest possible after disconnecting the power source working time.
- must always be triggered in the event of power failure on buses consumers, regardless of the cause.
- In the case of ABP arc protection circuit can be blocked in order to reduce damage from short circuits.
- In some cases, a switching delay ATS.

For example, when you run the powerful engines on the consumer side, the ATS scheme should ignore under voltage.

ATS must be triggered once. This requirement is due to the inadmissibility of multiple inclusion of backup sources in a short circuit. As the measuring element for the ATS in high voltage networks are under voltage relay (controller Atmega 8) connected to the protected areas using voltage transformers. In the case of a voltage drop in the electrical network protected plot relay gives signal to the ATS circuit. However, the lack of voltage condition is not sufficient to ensure that the ATS unit began its work. As a general rule, it should be satisfied with a number of conditions:

In the protected area there a short circuit. Since the voltage drop may be due to a short circuit, the inclusion of additional power sources into the circuit and inexpedient impermissible. Main disconnect switch is turned on. This condition is checked to the ATS does not work when the voltage has disappeared due to the fact that the main switch was switched off intentionally. On the neighboring property, which is supposed to be supplied after the ATS action voltage is present. If both supply lines are not energized, the switch does not make sense.

ATS consists of three main components:

1) Block logic and display - is the "brain" ATS, which constantly monitors the voltage in the core network, and operating the generator. "The brain" commands the relay automation, as well as the contactors to open or close.

2) The power of the ATS. It includes contactors and machines.

3) Relay generator control unit. In this unit includes a relay and a variety of switches to control the generator. This unit can be located in the shield ATS and on the generator.

ATS is a way of providing back-up power supply of consumers connected to the system and having at least two inputs and powering aimed at the stability of the electricity system. It is the automatic connection to the load standby power in the event of loss of principal. ATS system must operate for a minimum time after turning off the main power source.

ATS system is required to operate in the event of power failure on consumer tires, regardless of the cause. In the case of ABP arc protection circuit can be blocked in order to reduce damage from short circuits. In some cases, a time delay when switching ATS. For example, in the case of driving high-power electric motors on the consumer side, the ATS scheme should work properly under voltage.

ATS is triggered only once. This requirement is due to the inadmissibility of multiple inclusion of backup sources in the system, which has not yet accident.

The "iron" ATS implemented using relays for different purposes, digital protection units (ATS controller) switches - devices that include mechanical switching part, a microprocessor control unit, as well as the panel display and control.

II. Work ATS

As a measuring body in the ATS circuits used under voltage relay (Controller Atmega 8) connected to the controlled circuits. By lowering the voltage to the protective relay station responds and sends a signal to the circuit ATS.
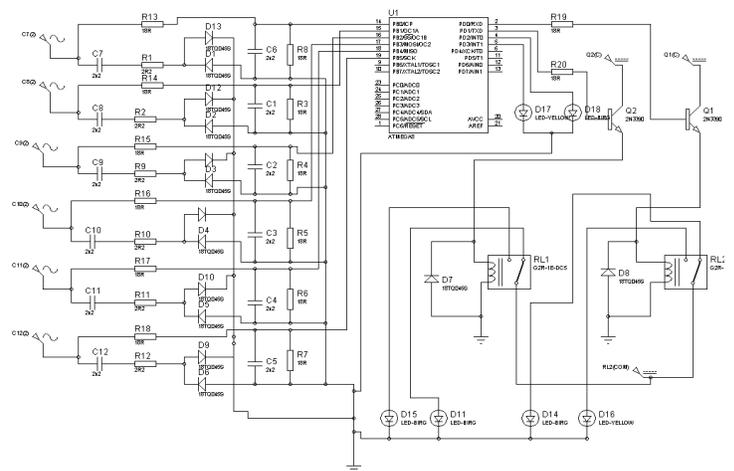
In addition, after the under voltage has the following conditions must be met:

1. In the controlled area is not short-circuited. Lowering the voltage it can in some cases be caused by a short circuit, and thus the connection to the chain of additional power supply is incorrect.
2. Main disconnect switch must be enabled to ATS mistakenly did not work because of the staff off the main switch.
3. In an alternative site voltage is present. In the absence of voltage on both lines switching it does not make sense.

After analyzing these conditions the ATS logic sends a signal to shunt trip breaker opening alarm circuit and disables it, and connects interlinear (or sectional) switch. AVR are divided into systems with recovery without recovery. In the first case, when a voltage at the input with fixed delay circuit restores the original script. Typically, this mode is selected by a lining of secondary circuits to the appropriate position. When restoring ATS possible short-term supply transformers work "in parallel" to security of electricity supply. When working without a recovery ATS scheme will not return to pre-accident conditions.

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