UDC 621.316.1

AUTOMATED CALCULATION OF SHORT-CIRCUIT CURRENT USING SOFTWARE «ELPLEK»

O. Gai, Ph.D.

S. Didenko, student

A rationale for the use of automated calculation of emergency operation of electric network voltage class. Examples task and further research.

Within the frame of practice professionals in the electricity sector often a need to calculate the value of short-circuit currents in electrical networks of different voltage levels.

The purpose of research - analysis of the feasibility of using automated methods of calculation to determine the profile of emergency in the electricity system and the formation of task for future research.

Materials and methods research. «Elplek» - this is one of the best free programs, designed for all kinds of short circuit current (three phase, interline, ground fault, interline ground fault), to find the residual stress in the network as well as to simulate actions of relay protection.

In addition, Elplek can be used for the calculation of flow capacity in the network. Calculations for finding short circuit can be performed by several methods - namely, by blending method (superposition) or in compliance with the IEC-60909.

But the calculation according to the standard IEC-60909 program are some minor limitations. This limitation is due to the fact that the steady-state current Ik as a function of time is not calculated and, therefore, for this calculation should use the method of superposition.

Pre-accident condition for the method of superposition can be obtained from the calculation of the cost burden from direct or decisions online. If the initial condition is calculated by the method of superposition, the currents are calculated as a function of time after a failure occurs in the network. In addition, a relay activation.

The advantages of the software include:

• Easy to use and intuitive interface;

• The results on the initial short circuit superposition method or according to standard IEC-60909;

• Calculation of short circuit current as a function of time;

• Reflecting activation overcurrent protection relay and distance relay (in standard IEC-60909 missing);

• Is the possibility of using different protective relays with independent time delay, with reverse time, PQG overcurrent protection relays and other relay;

• The presence of several dozen UIC curves relay programmed in IEC, ANSI (ABB, Westinghouse, English Electric, etc.);

• Display of phase currents and voltages.

Results.

Thus, the results differ slightly, the error in calculation is about 0.3%.

Conclusions

Having reviewed the software we found that «Elplek» still quite easy to use program has some flaws, it can not display the data on stroke current when making payments using the overlay and the calculation standard IEC-60909 steady-state current Ik" as a function of time not calculated. But it also has many benefits - free program has enough simple and intuitive interface, a fairly large selection of relay protection.