

IOT BASED LEAKAGE CURRENT MONITORING IN METAL OXIDE SURGE ARRESTOR

In this research a remote system for continuous monitoring of leakage current and ground current in surge arrestor is proposed. Surge arrestors are installed on transmission and distribution line in sub stations between phase and earth, in order to improve the surge arrestors also the performance and reduce failure rate. The performance of surge arrestors depends on the insulating property of Zinc-Oxide (ZnO). The deterioration of the insulating property increases with the increase in leakage current in arrestor. This leakage current depends on applied voltage and temperature at the time of measurement. In earth to line voltage, arrestor won't behave as an insulator. The ZnO surge arrestor have high impedance and resulting leakage current with a peak value of few milli amperes.

During over voltage events the metal oxide surge arrestor limits the voltage to almost constant value, even if the discharge current increases extremely. This capability has been found to remain unchanged during its full life, but the insulation performance at operating voltage may subject to change. However, under extreme condition it may lead to an increase of the leakage current. This changes called degradation of metal oxide surge arrester. The third harmonic of the resistive leakage current is responsible to the degradation of ZnO surge arrestor.

Thus the total leakage current is the combination of resistive leakage current and capacitive leakage current. In normal life of an arrester, there is very little change in the capacitive current; whereas marginal change in resistive current is observed due to change in insulation property of arresters. The increase in resistive leakage current causes either by entering moisture in ZnO blocks or by premature ageing of the ZnO blocks. This resistive leakage current is in phase with the applied voltage. So it generates power loss in the form of heat generation. Thus, the leakage current in arresters is divided into capacitive and resistive component. The capacitive current component is predominant and resistive component is significantly smaller. A recent huge interest in Machine to Machine communication is known as the Internet of Things (IOT), to allow the possibility for autonomous devices to use Internet for exchanging the data. Here, the design and the development for continuous monitoring of leakage currents and ground currents in high voltage surge arrestor is proposed using internet of thing concept.