Medium Voltage Underground Fault Localization Using CelloC System

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Abstract:

After a fault occurs on an underground distribution feeder, linesmen crews are deployed to reconfigure the network and resupply customers affected by the outage. Then, the part of the faulty line is taken into work authorization for localizing the fault and replacing the damaged splice or cable segment. The first step is a short duration HIPOT test to determine the faulty phase. The cable on each phase might hold the prescribed voltage showing a healthy phase, might not hold any voltage, showing a conductive fault, or might hold up to a certain voltage when a breakdown or flashover occurs. This last scenario is favorable to fault localization by traveling waves method.

The paper will introduce the novel underground fault localization system (UFLS) CelloC, based on traveling waves method, which targets an accurate timestamping of breakdown transients detected at extremities of the underground distribution feeder when a cable fault occurs. Combined with the network architecture data, fault position, either on the mainline/feeder or on a lateral can be very accurately located. Examples of laboratory and field fault localizations are discussed.