

Electromagnetic Simulation of Underground Cable Perforation by Nail

Authors : Ahmed Nour El Islam Ayad, Tahar Rouibah, Wafa Krika, Houari Boudjella, Larab Moulay, Farid Benhamida, Selma Benmoussa

Abstract : The purpose of this study is to evaluate the electromagnetic field of an underground cable of very high voltage perforated by nail. The aim of this work shows a numerical simulation of the electromagnetic field of 400 kV line after perforation through a ferrous nail in four positions for the pinch pin at different distances. From results for a longitudinal section, we observe and evaluate the distribution and the variation of the electromagnetic field in the cable and the earth. When the nail approaches the underground power cable, the distribution of the magnetic field changes and takes several forms, the magnetic field increase and become very important when the nail breaks the metal screen and will produce a significant leak of the electric field, characterized by a large electric arc and or electric discharge to earth and then a fault in the electrical network. These electromagnetic analysis results help to detect defects in underground cables.

Keywords : underground, electromagnetic, nail, defect

Conference Title : ICEM 2020 : International Conference on Electromagnetism and Magnetism

Conference Location : Paris, France

Conference Dates : May 14-15, 2020