Abstract :

A distance relay, which is widely used for protecting a power transmission line as the primary as well as remote backup device, may be affected by the power disturbances such as power swings and post-faults. Consequently, false trips of protection system may be resulted. Root cause analysis based on fault tree analysis has been used to identify disturbances which may lead to false trips. Once the critical root causes have been identified, conventional mitigation measures are used and then, new blocking function and digital filters are proposed to enhance the security of the system. The quantitative analysis of the improved model shows a significant increase in the security which implies an appreciable enhancement of the reliability of the considered protection system.