Multi-Objective Optimal Placement of FCL in IEEE RTS 24 Bus System: a Case Study Review

Ali Mahmoudian[1]

[1]Semnan University

May 5, 2020

Abstract

By increasing load demands and extending power networks to response customers need the complexity and integration of power systems have been boosted which increases the short circuit current level of the system that may be a threaten for network's reliability. Over these years, some approaches have been proposed to deal with this issue, reconfiguration of networks, increasing circuit breakers (CBs) capacity, and implementation of fault current limiter (FCL) is as proper examples. Reconfiguration and increasing CBs rating have applied exorbitant costs to the system and in some cases, it may be infeasible. Hence, FCLs can play a pivotal role in the mitigation of fault current level, but the effectiveness of FCLs is depended to the numbers and impedance of FCLs. In this paper, a novel and multi-objective approach are presented to optimize three objective functions including decreasing short circuit level, increasing the systems reliability level, and minimizing costs of FCL installations. Adaptive penalty factor and Pareto based Multi objective Evolutionary Algorithm Based on Decomposition (MOEA/D) is used to optimize the aforementioned objectives. Numerical and graphical results of optimization studies in MATLAB software on IEEE RTS 24-Bus system are confirmed the proposed approach efficiency.

Hosted file

`Ali Mahmoudian_Multi-Objective Optimal Placement of FCL....pdf` available at https://authorea.com/users/305238/articles/435900-multi-objective-optimal-placement-of-fcl-in-ieee-rts-24-bus-system-a-case-study-review