عنوان مقاله:

Multi-objective optimal location of inductive Superconducting Fault Current Limiter in presence of Distributed Generation with considering the fault risk

محل انتشار:

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خلاصه مقاله:

effectiveness of deployment fault current limiter (FCL) as a way to decrease the fault current level due to utilization of Distributed Generation (DG) has been proved. In this study, multi-objective decision-making and Revised Analytical Hierarchy Process (RAHP) optimization method has taken into account to determine optimal location of inductive superconductive FCL (SFCL) and reach to optimum value of technical and economical objects. Simulation result indicate the effectiveness of proposed method for determining number, location and size of SFCL with considering the fault risk. Proposed SFCL model simultaneously include electrical, magnetic and thermal dimensions.Fault risk was specified using a novel approach. In this study, an improved complex network model is taken into account and fault risk assessment has been done. Risk is defined by consequence and probability of the fault, which are affected by both power flow and network structure. Optimal options for applying fault to each line was determine using Pareto optimization method. Afterward priority of options was specified by using RAHP. Due to existence of core, inductive SFCL has more fault current limiting power in comparison with the resistive type. Also because of transformer ratio, it is possible to have large resistance in primary side just by little amount of superconductive material in the secondary side. However, the costs of construction and maintenance of inductive SFCL are much higher than the resistive type and result in bigger economic objective function, which reduce the industrial applications. By applying fault risk into result, priority of options change in a way to consider options for more sensitive lines

کلمات کلیدی:

fault current limiter, superconductivity, optimal location, multi-objective decision making, distributed generation, fault risk

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