Samira Salahi, Navid Rezaei and Jamal Moshtagh, 2020, An info-gap risk-averse optimization model for coordination of overcurrent protective relays considering power system uncertainty, *International Transactions on Electrical Energy Systems,* first published 21 September 2020.

Abstract The power system protection scheme must detect faults as soon as possible and isolate the faulty section from the rest of the network in the shortest possible time. Protection in medium voltage distribution networks is usually performed through applying coordinated protective overcurrent relays. Changes in the network topology and operational parameters may cause some uncertainties, which can have deteriorative impacts on the fault current measuring by overcurrent relays, hence lead to in-coordinated operation of the overcurrent relays. In this paper, it is aimed to optimally solve the problem of the overcurrent relays coordination considering the fault current uncertainty. To this end, a new risk-averse robust optimization portfolio is proposed based on information gap decision theory to derive the optimistic coordination scheme under severe uncertainties. The presented model is mathematically formulated and implemented effectively to some medium voltage test power systems. The illustrative numerical results demonstrate the effectiveness of the conducted optimization model in both risk-neutral and risk-averse strategies in procuring the robust coordination solution of the overcurrent relays.

Keywords information gap decision theory, overcurrent relays, power system protection, power system uncertainty, risk-aversion

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