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A NEW APPROACH FOR DETERMINATION OF BREAK POINTS FOR PROTECTION CO-ORDINATION

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Abstract Interconnected power system networks are multi loop structured. Settings determination of all overcurrent and distance relays in such networks can be in different forms and complicated. The main problem is the determination of starting points i.e. the location of starting relays in the procedure for settings, which is referred to as break points. In this paper, a new approach based on graph theory is introduced in which the relevant matrices dimensions are much reduced. The method is flexible and achievement of the desired solution can be obtained in a relatively short time.

Key Words Break Point Set, Protection System, Relay Co-Ordination

چکیده شبکه های سیستم قدرت بهم پیوسته دارای ساختار چند حلقه ای هستند. تعیین تنظیمات تمامی رله های جریان زیاد و دیستانس در چنین شبکه هایی شکل های گوناگون و پیچیده است. مشکل اصلی برای هماهنگی تعیین نقاط شروع هماهنگی، یعنی مکان رله های شروع در روند هماهنگی است که نقاط شکست نامیده می شود. در این مقاله، یک روش جدید بر مبنای تئوری گراف معرفی می شود که بعد ماتریسهای مربوطه را کاهش می دهد. روش ارائه شده قابل انعطاف است و نایل شدن به جوابهای مورد نظر در زمان کوتاه تری حاصل می شود.

1. INTRODUCTION

Many attempts have been made in the past for the co-ordination of overcurrent and distance relays settings both for interconnected and industrial power system networks [1]-[4]. The selection of appropriate settings by the co-ordination procedures leads to disconnection of minimum parts of the network under consideration [5,6]. The complexity of the problem increases with the number of loops presented in the system. A basic difficulty in setting relays results when one sets the last relay in a sequence, which closes a loop, it must coordinate with the one set initially in that loop. If it does not, one must proceed around the loop again. Of course, a given relay usually participates in more than one loop, so this procedure needs some organization. Indeed, for a given network we require 1) a minimum set of relays to begin the process with the break points 2) an efficient sequence for setting