Peerapat Chawthai 2015: Power Distribution System Maintenance Scheduling Based on Reliability Centered Maintenance Principle Using Binary Integer Programming. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Mr. Pisut Raphisak, Ph.D. 77 pages.

An efficient power system maintenance planning is an importance factor to improve the power system reliability. This thesis presents a method to select proper preventive maintenance activities based on Reliability-Centered Maintenance (RCM) and schedule the selected maintenance activities using Binary Integer Programming (BIP). In scheduling, activities are assigned to time slots based on the electric outage statistics to optimize chance to prevent outage and maximize reduced outage cost. Therefore, an index which reflects the opportunity to reduce outage cost when performing maintenance activities at different periods of time is developed by deriving from electric outage statistics and employed in the activity scheduling objective function. This thesis illustrates the procedure of selecting and scheduling maintenance activities by using collected electric outage data in year 2013 from one district electric utility as the case study. A first quarter of year 2014 maintenance plan for three feeders with highest outage is created under the following constraints. Each activity must be assigned to only one continuing time slot. Saturday and Sunday are holidays. There is only one maintenance team. (Therefore, multiple activities must not be assigned to the same day.) The result shows that 19 preventive maintenance activities are selected and the estimated reduced outage cost due to performing preventive maintenance is 6,455,047 bahts comparing to the previous year.

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