

STUDY ON THE MAINTENANCE POLICY BASED ON RCM FOR POWER CABLE LINES

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ABSTRACT

More than three maintenance modes, such as Corrective Maintenance, Time Based Maintenance and Condition Based Maintenance, are generally applied in China at the same time for ensuring power cable lines operated safely, reliably and economically. In order to increase the operation reliability of power cable lines and decrease their operation and/or maintenance cost, as well as operation broken-down ratio, how to set-up the mathematic mode for optimizing the maintenance policy was discussed by risk evaluation in this paper. The multi-factors of the cable line, including the current operation state, operation duration (or remain life), operation conditions, operation manner, family history, diachronic test records, status important grade, etc., were collected, analyzed and studied. In the paper, an application example with optimizing maintenance policy based on Reliability Centered Maintenance (RCM) and its program, flow chart were calculated and illustrated. The research results proved that the maintenance policy based on RCM in particular condition is more safely, reliability and economically.

KEYWORDS

Power cable; Maintenance policy; Reliability centered maintenance; Operation reliability; Performance evaluation

INTRODUCTION

Power cable manufacture and application technology in China have been developed more rapidly since 1995. For saving space resource and ground resource, a great deal of cable transmission lines and cable distribution lines are used in urban power networks. To resist natural disaster such as ice and snow, or floodwater, even though typhoon, etc., the ability of power networks has been enhanced greatly with the helps of power cables. Specially, larger cross section, longer distance and higher voltage cable lines occupied important place in main network structure, the social problems such as overhead line aisle, supply radius, supply reliability and public safety, as well as electromagnetic interfere are solved effectively. At the same time, the supply radius of cable lines and repair time of maintenance are increasing. Especially paroxysm operation fault may lead losing area increase. Therefore, maintenance policy, economic loss and social duty must be taken over.

In China, the maintenance policy of cable lines generally compartmentalize to Corrective Maintenance (CM), Time Based Maintenance (TBM) and Condition Based Maintenance (CBM). Among the 3 maintenances, power supply company gives the repairman basic guidelines to prepare the final policy to insure cable lines on the safe side. For example, the corrective maintenance is remove and assemble, maintenance, debug, repair or replace

when the function and assembly of the equipment or equipment accessories are lost of his control. Along with magnitude of cable lines increase, TBM is necessary but can not be suitable for great deal of cable lines. Manpower and substance absence, some cable lines may be superfluous maintenance and some cable lines may be disrepair or lack of maintenance. Meanwhile people and furnishment waste. Of course, CBM is a much better maintenance policy based on patrolling, inspecting, testing and monitor on-line or electrification inspector. Putative status evaluation, CBM may define how to arrange the maintenance plans for the max efficiency and max reliability.

From 2000's, many electrical researchers have discuss and study the Reliability Centered Maintenance (RCM) for electric equipments maintenance [1-4]. It is no doubt that RCM is a powerful arithmetic and attracts a great deal of sharp-eyed researchers. RCM is an international currency systems engineering arithmetic which research the function and fault analysis of the systems. Fault, fault reasons and fault aftereffect to be considered definitely, prevent countermeasure of every fault caused are confirmed with the use of standardization logic decision diagram. Local data statistics, specialist evaluation and rational mold analysis have the RCM changed into the target minimum of maintenance loss. All the works may be precondition of system security and system in good condition.

This paper studies the maintenance policy based on RCM for power cable lines and its program, flow chart were calculated and illustrated. The research results proved that the maintenance policy based on RCM in particular condition is more safety, reliability and economically.

MAINTENANCE STRATEGIES

All the researchers, who work in military affairs, airline company and machine manufacture, bring forward the logic decision diagrams of RCM which offer simply and comprehend guidelines of criterion to ensure which go-ahead maintenance policy is available and effective [5-7].

How to choose the maintenance policy is study first the technique characters of preventive fault. Contradistinguish the guidelines of applicability and check the real work application according to logic decision diagram of RCM. Only the technique characters satisfy all the applicability conditions of criterion, the technique characters of preventive fault are available. Otherwise, no one believes that is preventive fault. In fact, all kinds of works available in criterion are described as 5 aspects: (1) Available criterion of maintain work—surface cleanout, scrubbing and lubrication which design desirable or technique allowable are available. (2) Available criterion of TBM—a distinguishing length of service occurring, probability of condition fault of equipment may be increased during the