Ranking of IRAN 400KV Transmission Line Towers from view point of protection against Lightning ~~Stroke~~Strike

Abstract- Every year~~'s~~ the most number of overhead transmission line outages ~~has been~~ occur~~red~~ due to lightning ~~stroke~~strike. Hence, a complete protection for ~~high~~ high-voltage transmission lines must be designed. Lightning ~~overvoltage~~overvoltage are induced to phase conductor following shielding failure or back flash-over. Design of perfect protection ~~could~~ can be obtained by optimum arrangement of shielding wires. Shielding wires attractive radius depends ~~up~~on conductor height and amplitude of lightning current. A maximum lightning current exist which attractive radius of shield wires completely covered phase conductors and provide a complete protection. This current is called Maximum Shielding Failure current (IMSF) and ~~identified~~ identifies the number of lightning ~~stroke~~ strikes per unit time, which is ~~incidence~~ incident to phase conductor of transmission lines due to shielding failure. In this ~~paper~~paper, IMSF is calculated for ~~towers which~~towers, which are commonly used in Iranian transmission lines. Therefater, ~~and then~~ these currents are compared to each other. For each tower's probability of lightning ~~stroke~~strike with IMSF is computed by both IEEE and CIGRE methods separately, and finally, towers are ranked from view point of perfect protection against lightning. ~~Furthermore~~Furthermore, the effect of shielding angle on IMSF is investigated.

Keyword: ~~Lightning~~lightning, shield wire, ~~Maximum~~ maximum ~~Shielding~~ shielding ~~Failure~~ failure current, transmission lines, ~~Insulation~~ insulation coordination

1. INTRODUCTION

Lightning is the main cause of transmission line outage and the most number of ~~this~~ these outages are ~~occurred~~ caused by lightning ~~stroke~~strike to power system instrument. Thus, a safe protection against lightning must be designed to~~, till~~ increase ~~the~~ power supply reliability and decrease the economic ~~lost~~ loss of outages and instrument failure. Protection against lightning ~~stroke~~strike to phase conductors of transmission lines are provided by means of~~with~~ shield wires. Shield wires intercept the descending lightning leader, and the lightning current is conducted through the towers and dispersed by ground electrodes into earth. The shielding design of transmission lines, that is the appropriate positioning of shield wires with respect to phase conductors, can be achieved by implementing ~~electrogeometric~~electro geometricelectro geometric models~~,~~. A representative of their application is the method suggested by IEEE Standard 1243:1997, which assumes the striking distance to be solely a function of the prospective ~~stroke~~strike current [1], [2]. ~~shielding~~ Shielding design may be realized by employing models based on more solid physical ground of lightning attractiveness, called hereafter, generic models [3], [4]. A perfect shielding of transmission lines is achieved when

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