TITLE: Lightning Performance Improvement of the Swaziland Electricity Board Transmission System (66kV & 132kV lines

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ABSTRUCT:

Swaziland has a high lightning ground flash density and this has negatively affected the performance of the transmission system during summer (lightning season), and leads to loss of revenue to SEB and production losses to many customers. Power outages reports dating from 1997, 1998 and 1999 were analyzed and the results indicated that most power outages were due to lightning [1]. The high number of power outages that are attributed to lightning does not only affect Swaziland. More than 50% of electrical faults on transmission overhead are due to lightning [2], [3]. Owing to the good operating characteristics of metal oxide varistors lightning related power outages have been effectively optimized in many parts of the world utilizing zinc oxide transmission line surge arresters [4], [5], [6].
A pilot project was undertaken to install transmission Zinc Oxide (ZnO) Surge Arresters in one of the most affected 66kV lines. Implementation took place in August 2003 (Spring) at the beginning of the lightning season.
The project entailed analyzing the performance of three 66kV lines situated within the high ground lightning flash density area, implementation of the solution on the pilot line. The performance of the three lines was monitored over a period of one year. The results of the two test lines were compared to the results of the pilot project line.
The results indicated a marked improvement of the lightning performance of the pilot project line compared to the two test lines.
This paper discusses the Pilot project implementation, performance of the two test lines before and after the installation of the lightning arresters, recommendations and future work –based on the test results.

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