

THE CALCULATION OF ELECTRIC FIELD ALONG THE SURFACE OF 1100KV STATION POST INSULATOR UNDER IMPULSE VOLTAGE BASED ON ANSYS

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Abstract: This paper present a finite element model to study the distribution character of 1100kV station post insulators. The electric field distribution along the 1100kV station post insulators imposed on the standard lightning impulse voltage is calculated. The results show that under lightning impulse voltage, the curve of electric field distribution over time is similar to the form of the performance of the shock wave. The electric field of the first pair of big-small shed is larger and the electric field of the middle shed is relative small. The largest electric field occurs at the lower end of metal electrode surface, which is a serious problem for the dielectric material.

1 INTRODUCTION

As lightning and the design of the high voltage ceramic station post insulators, manufacture quality, installation and operation of maintenance and other reasons, The station post insulator pollution flashover is happened frequently.

2 RESULTS AND DISCUSSION

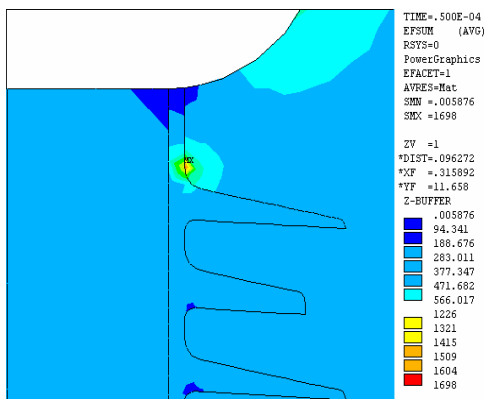


Figure 1: The contour of electric field (t = 50 μ s)

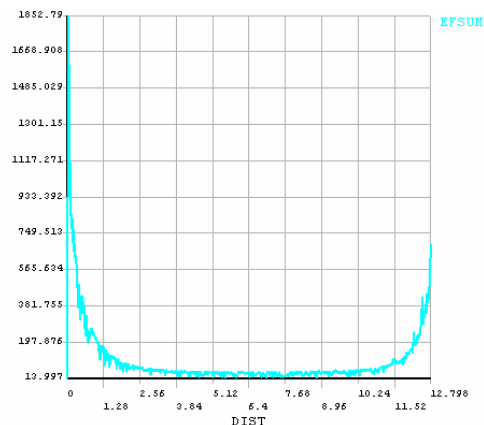


Figure 1: curve of electric field distribution(t=1.2 μ s)

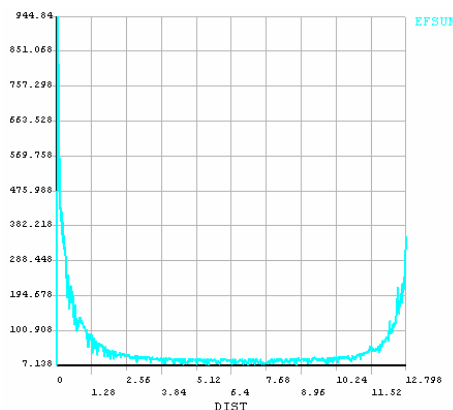


Figure 2: curve of electric field distribution(t=50 μ s)

3 CONCLUSIONS

- (1) The composite insulators have short shed spacing, which make the insulator easily been bridged and can't fully use the leakage distance, leading to decrease of flashover voltage.
- (2) The electric field of the first pair of big-small shed is larger and the electric field of the middle shed is relative small. This is true during the all response procedure.
- (3) The largest electric field occurs at the lower end of metal electrode surface, which is a serious problem for the dielectric material.

4 REFERENCES

- [1] GONG Zhu-guang Fundamental Application and Examples Analysis for ANSYS. Beijing: Engineering Industry Press.2004
- [2] CHEN Hong-bing. Research on External Electric Field Distribution of Post Insulator. Hunan Electric Power .2007.27(5):17-21
- [3] M. Farzaneh and J. Kiernicki. Flashover Problems Caused by ice Build-up on Insulators. IEEE Electrical Insulation Magazine, Vol.11, No. 2, pp. 5-17, March/April 1995
- [4] FANG Ke-fu; WU Guang-ya; LIU Zhi-qiang. Approaching to Design of Polluted External Insulation of Substation Post and Hollow Insulator of A.C.1000Kv. 2007.215(1):1-5