接地電極のサージインピーダンスに関する研究

著者	高島 武
著者別表示	Takashima Takeshi
雑誌名	昭和61(1986)年度 科学研究費補助金 一般研究(C) 研究成果報告書概要
巻	1985　1986
ページ	2p.
発行年	1988-11-08
URL	http://doi.org/10.24517/00068029

1986 Fiscal Year Final Research Report Summary

Study on Surge Impedance of Grounding Electrode

Research Project

Project/Area Number

60550199

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

電力工学

Research Institution

Kanazawa University

Principal Investigator

TAKASHIMA Takeshi Professor, Faculty of Technology, Kanazawa University, 工学部, 教授 (10019739)

Co-Investigator(Kenkyū-buntansha)

ISHIBASHI Ryozo Professor, Faculty of Technology, Kanazawa University, 工学部, 教授 (50019692)

Project Period (FY)

1985 – 1986

Keywords

Grounding electrode / Grounding impedance / 地中電流の作る磁界

Research Abstract

Surge impedances of grounding electrodes were studied in numerical calculations and in field measurements.
(1) In the numerical calculations, the magnetic field induced by the ground current (current which was injected from the grounding electrode into the ground) was taken into account. It was found that this magnetic field considerably increased the inductance of the vertical electrode, but did not influence the inductance of the horizontal electrode.
(2) In the field measurements, surge impedances of actual vertical linear electrodes were measured by the use of a surge-impedance tester (current of 0.4 A, building-up time of 1 <micro> sec). It was found that the grounding impedance of the vertical electrode did not much decrease even if the electrde was much lengthened, while the grounding resistance much decreased then. Namely there was an effective length of the electrode from the viewpoint of grounding impedance. For an example, the effective length of the vertical electrode was about 20 m, when the resistivity of the soil was 158-190 <OHM> m. As to the effective length, there is an effective length also for a horizontal electrode, and the effective length for each electrode's type is defferent when the

resistivity of the soil is different.
(3) In comparison between the calculated impedances and the measured ones, when the electrode was short (about 2 m), the calculated impedance nearly agreed with the measured one, but, when the electrode was long (10-200 m), the calculated one was much greater than the measured one. The reason for the error was sought and seemed that the effect of the attenuation in the propagation was not taken into account in the calculation. Thus a problem in the future is that an improved method of calculation needs to be proposed, where the attenuation is taken into account.

Research Products (4 results)

All | Other

All | Publications (4 results)

[Publications] A.Ohtsubo: Trans.I.E.E.of Japan. 105. 103-107 (1985)

[Publications] 高嶋武: 放送文化基金研究報告. 10. 41-45 (1987)

[Publications] Akira Ohtsubo: "Method of Images for Representing Magnetic Fields Due to Distributed Currents in Two-Layer Media" Trans. I.E.E. of Japan. 105. 103-107 (1985)

[Publications] Takeshi Takashima: "Study on Effective Grounding of Transmitting Antenna for Lightning" Research Report (Housou-Bunka Foundation). 10. 41-45 (1987)

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-60550199/605501991986kenkyu_seika_hokoku_

Published: 1988-11-08