25. A CONSIDERATION OF THE RADIO-FREQUENCY VOLTAGES ENCOUNTERED BY THE INSULATING MATERIAL OF BROADCAST TOWER ANTENNAS

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A knowledge of the radio-frequency voltages on the insulation of broadcast tower antennas is important to the design engineer since a too-large factor of safety may add unduly to the tower cost.

Attention is first given to the base-insulator voltage. The magnitude of this voltage is also of interest in the design of lighting chokes and coupling equipment. Theoretical values are derived and shown in curve form as a function of antenna height. The theoretical curves are supplemented by experimental data taken on self-supporting tapered, guyed cantilever, and guyed uniform-cross-section towers, and guyed tubular steel masts.

A theoretical treatment is then given concerning the role of guy wires from an electrical standpoint. Consideration is given to the currents in the guys and the voltages on the guy insulators. Measurements are presented of the voltages existing on the guy insulators of two guyed masts of different construction.

These voltages are found to be so small that there seems little need for elaborate insulation except for the presence of high static or induced lightning voltages. The paper is concluded by some considerations of ways of providing protection against these high instantaneous and random voltages without the use of expensive and elaborate insulation.

9. DESIGN REQUIREMENTS FOR BROADCAST-STUDIO AUDIO-FREQUENCY SYSTEMS

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The design of broadcast-studio audio-frequency facilities divides itself naturally into two categories. First, there is the design of the individual circuit components. Second, there is the design of the complete system utilizing these components. This paper, which is confined to this latter concern, outlines present-day operating and performance requirements. Specific fidelity requirements are given and a typical system design presented.

6. RECENT DEVELOPMENTS IN RADIO TRANSMITTERS

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This paper outlines and illustrates the mechanical and electrical developments that have been incorporated in the design of radio transmitting apparatus. Various systems of modulation, the application of feedback, and the modulation requirements for broadcast service are discussed. Diagrams and photographs indicate the extent to which multielement tubes are being applied in high-frequency apparatus. Numerous photographs indicate the trend in industrial styling.