

# High-Voltage Line Sheds Lightning Bolt Barrage

## Struck 198 Times Yearly, Devices Maintain Service on Big Boulder Transmission Line

Although it is struck by lightning hundreds of times each year, Los Angeles big Boulder Transmission Line is able to shake off lightning bolts and go right on delivering power here from Hoover Dam with hardly a flicker of interruption.

This was the interesting observation yesterday of Los Angeles City Department of Water and Power engineers, as another winter season of storms approached with its attendant problems for the men whose job it is to keep power flowing into the city's homes, offices, stores and factories.

Along the 226 miles of the Boulder Transmission Line, with its triple series of great steel towers, numerous storms are regular seasonal occurrences. In the mountains and deserts crossed by the city's main power-line, storms frequently are accompanied by spectacular lightning flashes.

### Service Unbroken

In the more than 13 years since the great 287,500-volt line was put in operation making available to Los Angeles almost half a million kilowatts of electric power, the three-circuit line has been struck by lightning repeatedly without any noticeable break in electric service.

Studies made by T. M. Blakeslee and E. L. Kanouse, Department of Water and Power engineers, show that the Boulder Transmission Line has been hit by lightning 2568 times in the past 13 years, or an average of 198 strokes per year.

Despite this electrical bombardment, the record shows only three "trip outs," or interruptions in service of the line due to lightning in all those years—an outstanding record of continuous service.

### Special Features

The reason for its ability to sustain the worst lightning bolts and still suffer no "outage" in the flow of electricity is found in the line's special construction features.

Mounted on top the towers above the three thick cables which carry the line's 287,500-volt current are two smaller wires, which together with the towers themselves act as a continuous set of lighting rods.

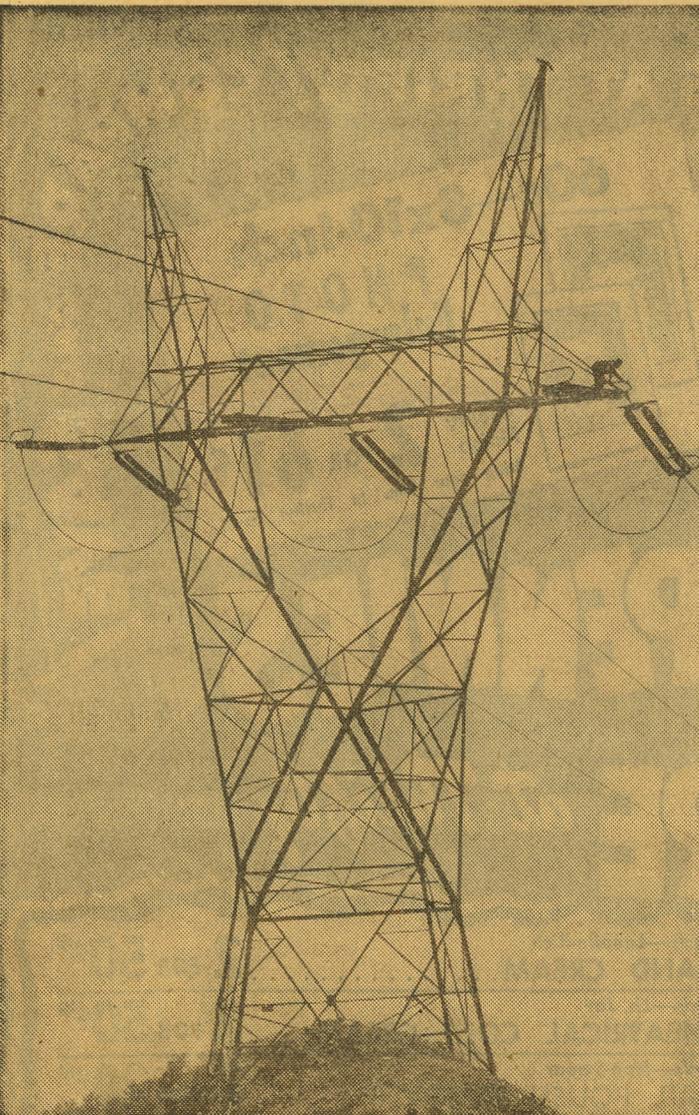
When a bolt from an electrical storm hits one of the small overhead wires or one of the towers, the electric charge is conveyed down into the ground without affecting the main power cables, which are thoroughly insulated from the towers.

In passing down the steel towers and into the ground, the

lightning strokes flash across counterpoise gaps set in the leg of the towers. The melting or fusing effect in the gaps indicates the passage of the lightning charge and its intensity.

Other lightning data is furnished Department of Water and Power engineers by magnetic links, or surge crest meters, installed at selected locations along the Boulder Transmission Line, and by recording devices attached to lightning rods at the terminals and the switching stations along the line.

On the basis of this data, the engineers can figure the number of lightning strokes that hit the power line and determine the charges of storm-electricity which pass through the towers but do not halt the flow of Hoover Dam power which has proven so dependable to Los Angeles homes and factories.



**CHALLENGE TO NATURE**—Overhead ground wires on tips of horns of the Boulder transmission line towers, serve as a continuous lightning rod along 266 miles.



**AVERTS DAMAGE**—Robert Kennedy, line patrolman for Department of Water & Power, points to counterpoise gap which carries lightning harmlessly into the ground.