Audible Noise Analysis of 750 kV AC Transmission Line in High-altitude Area Under Different Weather

yemao zhang[1], Jilai Xu[2], Ni Li[2], Lijian Ding[1], and Xiong Wu[2]

[1]Hefei University of Technology
[2]China Electric Power Research Institute

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Abstract

In order to build UHV AC transmission lines at high altitudes, it is necessary to analyze the audible noise characteristics of the existing EHV transmission lines at high altitude areas to guide the design. The typical test data of audible noise for 750 kV single circuit transmission lines measured at the Guanting long-term observation station, located at an altitude of 1854 m, were collected. Two methods of sorting the test data of audible noise and extracting valid data were given. Then the levels of audible noise under different weather conditions were analyzed, which showed that audible noise was raised with the increase of instantaneous rainfall and snowfall. Typical frequency spectrums of audible noise under different weather were also obtained, the pure tone at 100 Hz was more prominent under rainy and snowy weather, and the pure tone oscillation attenuated at different positions. Audible noise at different locations presented the better attenuation characteristics with the increase of distance during rainy days. The statistical results and calculated difference of audible noise over 5.5 hours with continuous rainfall were obtained. For the quiet plateau areas, the calculated difference between audible noise during rainy days and fair weather can be taken as 25 dB.

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