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Discussion on the Control Standards of Moisture Content in SF6 Electrical Equipment

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SF6 is widely used in high-voltage equipment due to its excellent insulation ability. However, when the moisture content in SF6 exceeds a certain value, its insulation could be damaged, threatening the normal operation of high-voltage equipment. Therefore it's of great importance to establish proper control standards on moisture content in SF6.

In this paper, the influence of moisture content on flashover voltages of cylindrical insulator models in SF6 is studied by controlling the moisture content in a specially designed organic glass chamber, and then the feasibility of three common moisture controlling methods are discussed.

The results show that controlling moisture content in the form of volume fraction can directly limit the absolute content of water vapor and prevent the formation of harmful decomposition products. However, the measured values of volume fraction at different temperatures should be rectified to a common temperature, making it inconvenient to use; the form of relative humidity can reflect the condensation margin of water vapor and could be used without consideration of temperature, but it cannot directly show the absolute content of water vapor, making it difficult to control the production of discharge products; the dew point temperature cannot reflect the real condensation temperature of water vapor, so the method of controlling dew point temperature below zero degree is not scientific. In conclusion, 200 uL/L and 15% are suggested as the limiting values in the form of volume fraction and relative humidity according to the experimental results, which can serve as reference for the revision of the existing control standards.

Author: MA, Jingtan (Xi'an Jiaotong University)

Co-authors: GUO, Can (Xi'an Jiaotong University); YOU, Haoyang (Xi'an Jiaotong University); Prof. ZHANG, Qiaogen (Xi'an Jiaotong University); WEN, Tao (Xi'an Jiaotong University); ZHANG, Xin (Shenzhen Power Supply Co. Ltd.); QIN, Yifan; WU, Zhicheng (Xi'an Jiaotong University)

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