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直流电压下复合绝缘子的自然积污试验

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摘要
利用自建的自然污秽试验站，对自然条件下带直流电压运行2个积污季节的复合绝缘子的积污特点进行了试验研究，分析了直流绝缘子的伞裙表面积污规律、降水对积污(等值附盐密度(equivalent salt deposit density，ESDD)和不溶性污秽物质密度(non-soluble deposit density，NSDD))的影响，表面污秽不均匀度、表面灰盐比、ESDD和NSDD的直交比等。研究表明：并不是所有降水都会对绝缘子表面污秽产生明显的清洗效果；降水量和雨强均为清洗效率的重要影响因素；复合绝缘子最大污秽度出现在夏季多雨季节来临前。建议直流外绝缘设计中充分考虑这些积污特点。

关键词 直流复合绝缘子；自然积污；等值附盐密度；不溶性污秽物质密度；降水；高电压与绝缘技术

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Natural Pollution Deposit Test of Polymeric Insulators Operated under DC Voltage

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Abstract
By use of self-built natural pollution test station, the experimental investigation of natural pollution deposit (NPD) features of polymeric insulators operated under DC voltage in northern China’s inland areas for two contaminated seasons is carried out. In this paper, the surface pollution deposit law of DC insulator shed, the influence of rainfall on pollution deposit (equivalent salt deposit density, ESDD) and non-soluble deposit density (NSDD), unevenness of pollution between top and bottom surface, dust to salt ratio of insulator surface, the orthogonal ratio of ESDD to NSDD and so on are analyzed. Research results show that not all rainfall achieves obvious purging efficiency on pollution deposited on insulator surface; both the amount of precipitation and rainfall intensity are important factors influencing purging effect; the maximum pollution degree of polymeric insulator occurs before rainy season in the summer, but not before spring rain. It is recommended that these features of pollution deposit should be adequately considered in the DC outdoor insulation design.

Key words DC polymeric insulator；natural pollution deposit；equivalent salt deposit density；non-soluble deposit density；rainfall；high voltage and insulation technology

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