

Research on Placement Method of the Magnetic Flux Leakage Sensor Based on Online Detection of the Transformer Winding Deformation

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Abstract : The transformer is the key equipment of the power system. Winding deformation is one of the main transformer defects, and timely and effective detection of the transformer winding deformation can ensure the safe and stable operation of the transformer to the maximum extent. When winding deformation occurs, the size, shape and spatial position of the winding will change, which directly leads to the change of magnetic flux leakage distribution. Therefore, it is promising to study the online detection method of the transformer winding deformation based on magnetic flux leakage characteristics, in which the key step is to study the optimal placement method of magnetic flux leakage sensors inside the transformer. In this paper, a simulation model of the transformer winding deformation is established to obtain the internal magnetic flux leakage distribution of the transformer under normal operation and different winding deformation conditions, and the law of change of magnetic flux leakage distribution due to winding deformation is analyzed. The results show that different winding deformation leads to different characteristics of the magnetic flux leakage distribution. On this basis, an optimized placement of magnetic flux leakage sensors inside the transformer is proposed to provide a basis for the online detection method of transformer winding deformation based on the magnetic flux leakage characteristics.

Keywords : magnetic flux leakage, sensor placement method, transformer, winding deformation

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