Research on error control of optimal computation combining temperature field with ampacity of cables under complicated conditions.

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There are many factors affecting the cable ampacity. The error will be large when calculating the ampacity of cables in multi loop cable cluster laying according to the traditional method. For this reason, this research, based on the knowledge of heat transfer, compute the cable temperature field, structures heat conduction equation and boundary condition, and applys optimal numerical computation of temperature field and ampacity of cables under complicated conditions. It uses the finite element method to compute temperature field outside the cables and the cable surface temperature and uses temperature formula to derive the ampacity of cables. Then, it effectively avoid the theoretical model's defect that it cannot compute temperature field outside the cables exactly. This method combines the finite element method with theoretical model and controls the error from an integrated viewpoint. In comparison with the traditional method, it shows that the error is controlled within 3.1%.

Key words

Cables ampacity; Complicated conditions;Finite element;Theoretical model;Error control