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Investigation of Electromagnetic Force in 3P5W Busbar System under Peak Short-circuit Current

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Abstract : Electromagnetic forces on three-phase five-wire (3P5W) busbar system is investigated under three-phase short-circuits current. The conductor busbar placed in compact galvanized steel enclosure is in the rectangular shape. Transient analysis from Opera-2D is carried out to develop the model of three-phase short-circuits current in the system. The result of the simulation is compared with the calculation result, which is obtained by applying the theories of Biot Savart's law and Laplace equation. Under this analytical approach, the moment of peak short-circuit current is taken into account. The effect upon geometrical arrangement of the conductor and the present of the steel enclosure are considered by the theory of image. The result depict that the electromagnetic force due to the transient short-circuit from simulation is agreed with the calculation.

Keywords : busbar; electromagnetic force; short-circuit current; transient analysis
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