

Development of a Prototype of a Compact 145 kV Substation Inside a Metallic Building

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Abstract: This paper presents the development of a prototype of a substation of 145 kV, BIL 650 kV, taking into account the decrease of the bus electrical insulation clearance, combined with the installation inside a metallic building. Only conventional equipment, usually found in the market, were applied in the prototype. During the preliminary approach tests were carried out in the High Voltage Laboratory, using different bus-bar configurations and equipment, as circuit breaker, current transformers, potential transformers, switches and insulators, applying models with metallic wall. The proposed prototype was then built and fully tested according to the IEC recommendations, mainly from the point of view of lightning discharge withstand. The paper shows the layout and clearances used in the model. The result of the tests in the prototype of the compact substation for 145 kV, with BIL 650 kV, is also presented, proving the feasibility of the new proposal.

Keywords: Substation, compact substation, insulation clearance, high voltage, high voltage tests, prototype, tolerance.

Preprint Order Number: PE-376-PWRD-0-01-1999

Discussion Deadline: June 1999