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RELIABILITY EVALUATION FOR INTERCONNECTION PLANNING IN NORTH EAST ASIA

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Abstract. *This paper presents a reliability evaluation procedure for interconnection planning using a tie line constrained equivalent assisting generator model (TEAG) that considers the uncertainties of the interconnected transmission systems and the tie lines. Development of this model was triggered by the need to perform probabilistic reliability evaluations on the NEAREST (North East Asia Region Electric Systems Tied) interconnection. The TEAG is the basis for the newly developed interconnection systems reliability evaluation computer program, NEAREL. The model is capable of considering uncertainties associated with generators, tie lines, and the tied grids. Reliability evaluations for six interconnection scenarios involving the power systems of six countries in the Asian north eastern region were performed using NEAREL. Sensitivity analysis was used to determine reasonable tie line capacities for three interconnected country scenarios of the six countries. Test results and summarized comments on the scenarios are included in the paper.*

Keywords: Interconnected system reliability evaluation, Northeast Asia, TEAG

1. **Introduction.** The interconnected power systems in Northeast Asia have been receiving growing attention. The peak load in South Korea generally occurs in the summer while that of countries in the north Asia area including far east Russia occurs in the winter. As a result, interconnecting these power systems becomes attractive from the view points of economics and reliability [1]. The primary function of an electric power system is to provide electrical energy to its customers as economically as possible and with an acceptable degree of continuity and quality [2]. The adequacy of the generating capacity in a power system is normally improved by interconnecting the system to other power